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Summer Training for Veterinary Reserve Officers

Seventeen veterinary reserve corps officers from the sixth and seventh corps area and three regular army veterinary officers attended the medical officers' training camp for a fifteen-day period, July 7th to 20th inclusive, at Ft. Snelling, Minnesota.

The illustration shows the reserve officers and Captain H. M. Savage (at left), post veterinarian, in front of the post veterinary hospital at Ft. Snelling.

Without exception, the reserve officers were pleased with the course of instruction given them and expressed the hope that they may be able to continue their training next year. Ft. Snelling is a delightful location for a summer camp, being situated on rolling, well wooded ground at the junction of the Minnesota and Mississippi rivers and near the twin cities. About 300 medical, dental and veterinary officers were in attendance at the camp.

The reserve veterinary officers were: Lieut. Cols. N. S. Mayo and G. C. Miller; Majors D. M. Campbell and H. B. Raffensperger; Captains L. R. Smith, J. J. Roberts, H. B. Giles, H. W. Tornow; 1st Lieuts. B. L. Candill, D. H. Bibens, E. N. Davis, J. R. McIllra, H. E. Stearns, H. P. Stout, H. W. Knoenschild; 2nd Lieuts. L. E. Long, V. M. Kaliher and A. J. Matter.

Most of the instruction for reserve officers consisted of lectures by regular army officers. These lectures were usually given to small groups in the shade of trees. The above shows a group of Veterinary officers.

WINNING THE BATTLE AGAINST INSECT BORNE DISEASE

Two veterinarians of the U. S. Bureau of Animal Industry, Smith and Salmon, by careful, painstaking experiment discovered the part of the Boophilus bovis in the life history of the piroplasma of southern cattle fever and made possible the reclaiming of a vast territory for profitable cattle raising. The great economic value of this discovery can scarcely be computed. It probably exceeds annually the entire cost of the Federal Bureau of Animal Industry since its foundation.

With this discovery as a basis upon which to build, Walter Reed and his co-workers promptly worked out the role of the mosquito in the spread of yellow fever. With these facts in their possession, public health authorities banished "Yellow Jack" from New Orleans and the United States, General Wood eradicated it from Havana, and Colonel Gorgas made possible the building of the Panama Canal, the most monumental achievement of modern hygiene. Since the death rate in the canal zone was reduced by sanitation to a point lower than that of continental United States, the elimination of yellow fever has progressed rapidly in other lands.

The deaths from yellow fever in Rio de Janeiro were reduced from 984 in 1902 to 0 in 1909. In 1919, the disease was eradicated from Guayaquil, Ecuador, the chief endemic center on the continent, and from Peru in 1921. The work had progressed by the end of 1923 to a point where there had been no cases reported during the year in Mexico or Central America, and protective measures were well under way in Colombia and Brazil, the last remaining areas of infestation in the Western Hemisphere.

RIDING HORSES POPULAR IN CHICAGO

Horseback riding has increased more than 100 per cent in Chicago during the last four years. There are forty riding stables and academies with more than 1,700 horses; 5,200 riders, 65 per cent of them women, use the bridle paths weekly in the city parks, and many others ride in the forest preserves.

A new million dollar riding club will be opened on the lake shore, October 1st. It will be the largest, most completely equipped riding club in the world.

There are a half dozen polo teams in and about the city, and a polo team of girls is being organized.

VETERINARIAN INVENTED THE BALLOON TIRE

The press has recently carried a story showing that balloon tires for automobiles are really not a new thing, but that the first pneumatic tire made and patented by John Boyd Dunlop, a veterinary practitioner of Belfast, Ireland, in 1888, was actually a balloon tire.

Readers of Veterinary Medicine will recall the story of the invention of the pneumatic tire published at the time of Dr. Dunlop's death some four years ago. The first rubber tire on a canvas base was made for a bicycle belonging to the inventor's son, and it was not until some time later that its commercial possibilities were realized.

UNUSUAL METHODS IN SUPPRESSING CATTLE PLAGUE

Except for a few new flare-ups which were promptly suppressed, the federal and state veterinary forces engaged in suppressing foot-and-mouth disease in California continue to control the situation. According to a statement issued by the United States Department of Agriculture July 28, three cases of new infection were found during the week preceding that date. One occurred in Los Angeles County, July 21, involving 87 cattle, 7 hogs, and 2 goats. All the animals were destroyed the same day the infection was found. The premises on which the disease occurred was only a few hundred feet from a farm which previously contained infection, thus accounting for the outbreak.

The following day two herds in Tuolumne County showed symptoms of the plague. These herds contained 226 cattle, 1,071 sheep, and 12 goats, which were infected or exposed. The animals were all promptly slaughtered and buried. In the 14 other counties which originally contained the disease no new cases have appeared for 38 days.

Owing to the numerous obstacles confronted by veterinary inspectors in suppressing foot-and-mouth disease, it will be difficult to state positively, the department announces, when the last trace of virus has been destroyed. Tuolumne County, California, where the most recent cases appeared, contains heavily wooded, rough, and broken terrain. The present work includes inspection of the cattle as fast as they can be rounded up, patrolling the borders of the infected area to keep healthy animals from straying on to it, and the prompt slaughter and burial of animals found infected or grazing on the dangerous range. Inspectors have saved time and much expense by adopting methods

never before used in suppressing a contagious disease in the United States. In cases where the rocky soil has precluded the use of trench-digging equipment they have driven the infected animals into deep ravines or blind canyons, slaughtered them, and then dynamited the sides of the canyons to cover the carcasses. In still other cases abandoned railroad cuts have been used.

TUBERCULOSIS PREVENTATIVE

The daily press carries the announcement that Calmette of the Pasteur Institute, who has devoted more than a score of years to the study of tuberculosis, has discovered a vaccine that confers immunity to the disease.

Because of the high standing of Calmette, consideration must be given the announcement. Reports from Paris describe the use of the vaccine on 217 babies born of tuberculous parents. These children were not separated from their parents so that they continued to run the risk of infection. The first human experiment was made less than two years ago and the time is still too brief to determine fully the effects of the treatment, but so far none of the babies has evidenced a trace of the malady. Dr. Calmette asserted that his inoculation must be made within twenty-four hours after the birth of the child. He does not claim that it will effect a cure of tuberculosis if it already exists, but will prevent subsequent infection.

UNIVERSITY OF CHICAGO OFFERS COURSE IN MEAT PACKING

Because many hundred veterinarians are employed in the meat packing industry, and nearly all other veterinarians are directly dependent upon the livestock industry which is possible in its present development because of the packing industry, our readers cannot fail to be interested in the new course of instruction in the science, art and practice of meat packing established by the University of Chicago in co-operation with the Institute of American Meat Packers.

This school is the outgrowth of a movement started by Thomas E. Wilson when president of the Institute of Meat Packers and consists of four units or projects.

1. An evening course comprising many different subjects, each arranged for one recitation a week and extending over one college year. It is designed for persons employed in the packing industry in Chicago.

2. A correspondence course covering the same subjects for persons employed in the packing industry outside of Chicago.

3. Research into the problems confronting the packing industry.

4. A four-year residence course comparable to other courses of the university.

The latter course is intended for those desiring a thorough grounding in the science and practices of meat packing as a preparation for employment in the industry. It is expected to appeal strongly to the sons and daughters of officials and others in the packing industry.

Dr. Fred Eagle, of Wilson & Company, a widely known veterinarian, is one of the instructors in the four-year course.

IDEALS OF VETERINARY COLLEGES DETERMINE SOCIAL STATUS OF PROFESSION

In Volume II of the History of Veterinary Literature by Major General Fred Smith, now being published serially in The Veterinary Journal, the following passage occurs concerning Sainbel, the founder of the London Veterinary College, the first college of its kind in any English speaking country.

"We see here the lofty tone adopted by Sainbel; he asks for the best type of man to be educated as a veterinary practitioner. This is why he pressed the point of excluding from the teaching staff all who were not versed in the sciences or had only a limited acquaintance with their profession. If these, he says, are admitted to train the rising generation, errors and methods which ought to be excluded will form part of the course. Had Sainbel lived this ideal would have been carried out; he knew it was the pivot on which the whole future scheme rested. Unfortunately for the profession, he was succeeded by a man who took the opposite line; the college system of internal students was abandoned and the minimum of three years' instruction under Sainbel's scheme was reduced to as many months. Coleman regarded veterinary education as extremely simple and readily acquired, and believed that the stable and forge supplied the best type of practitioner, while the medical man or medical student was the worst. Half a century of such an administration settled our fate and social status."

If the policies of Coleman (Sainbel's successor) during the first half of the nineteenth century could influence to so great a degree the attitude of the public toward the profession a century later, what may not be said of the influence of the policies of the numerous American veterinary colleges two generations later? Have our fate and social status, too, been settled for a hundred years and more?

Equine General Anesthesia

By J. P. Foster, M. S., M. D. V., Minneapolis, Minn.

Chloroform, and chloral hydrate, will be discussed as the agents employed for inducing anesthesia in the horse. While other drugs, either alone or in combination, have been employed for this purpose, those mentioned have proved the most satisfactory in our experience.

Except in instances in which operations are to be performed upon patients in the standing position under the influence of chloral hydrate, it is advisable to reduce the supply of hay or other coarse food to a minimum for at least twenty-four hours prior to the operation. The grain diet should be laxative and easily digestible, and water should be withheld for several hours previous to the time set for the operation.

Contraindications

According to some authorities, general anesthesia is not permissible in patients suffering from septic conditions. If this contention is correct, it would be unsafe to administer a general anesthetic as preliminary to operation in cases of fistulous withers, poll evil, schirrous cord, and many other conditions too numerous to mention. On the other hand, many practitioners insist that the danger of administering a general anesthetic to animals suffering from certain septic conditions has been overestimated. General anesthesia, especially that induced by chloroform, is clearly contraindicated in patients affected with cardiac, or pulmonary lesions, and in animals having laryngeal or tracheal lesions or malformations to the extent of embarrassing the respiration. Chloroform anesthesia never should be employed in animals suffering from debilitating diseases, nor in cases in which the surgical operation necessitating the anesthetic causes an excessive loss of blood.

Chloroform Anesthesia

If administered with care and good judgment, chloroform is a safe and reliable anesthetic, and as its employment never has been considered especially dangerous in equine practice—except in those conditions in which it is clearly contra-indicated—no preliminary medical treatment is considered advisable or necessary. One good authority suggests the administration of a medium sized dose of chloral hydrate one hour before beginning the chloroform anesthesia.

A good serviceable chloroform inhaler may be made by any competent harness maker. It consists of a piece of canvas rolled into the form of a cylinder, sixteen inches in length, and of sufficient diameter to pass over the patient's muzzle exclusive of the lower lip; the upper end or edge being carried into the mouth as far as the labial commissures. The upper end of the cylinder should have a light flexible strap passing around its circumference and held in position by loops sewed to the canvas. This strap should be buckled tightly around the face, in order to prevent as far as possible the entrance of air. Another strap should pass from one side of the canvas—near the point where it contacts the commissure of the lip—over the poll to be attached to a like point on the opposite side. This strap should be adjustable like a bridle, so that it may be made to fit different sized individuals. At about three inches from the lower end of the canvas a "puckering string" should be adjusted. A space several inches in length thus will be left between the nostrils and the point where the "puckering string" encircles the canvas. The nostrils should be smeared with vaseline. The sponge after being placed in water and then squeezed as dry as possible, is saturated with chloroform, inserted in the lower end of the canvas cylinder, and the "puckering string" drawn moderately tight. The sponge rests just above the constriction thus formed. In anesthetizing a medium sized animal about one ounce of chloroform is first placed upon the sponge, and from one to two drams added as often as is required during the progress of the anesthesia. In lieu of an inhaler as described, an old pant or overall leg may be utilized.

The tongue should be drawn forward, and in some instances it may be advisable to tie a cord around its free portion, bringing the ends of the cord out of the mouth—one on each side—and tying them under the lower jaw. This precaution will prevent so-called "swallowing" of the tongue.

Too much dependence should not be placed upon the reflexes of the cornea as an index to the safety of the procedure. Respiratory and cardiac action should be closely observed. At the first indication of embarrassment of these functions, the chloroform must be withheld, and all efforts bent toward restoring the patient by means of artificial respiration, and the administration of strychnin.

Chloroform is said to reach the tissues by means of the erythrocytes which serve as carriers of chloroform in a manner similar to that in which they act as carriers of oxygen. The chloroform is given off to the tissues, and that which is taken up by the nervous system causes stimulation of the nerve centers as evidenced by the "stimulating stage" or "stage of excitement." If this stimulation is carried to excess by reason of too rapid absorption of the drug, it finally may bring about paralysis of the respiratory center. It is stated that in cases in which excessive stimulation is followed by paralysis, the absorption of chloroform is so rapid that part of it is taken up by the plasma and thus conveyed to the tissues.

The Standing Method

To those who may desire to give the standing method of inducing chloroform anesthesia a trial, the following procedure is recommended: Select a small and substantially fenced grass plot as a suitable place for carrying out the subsequent operation, or in the absence of such a place, a paddock, or large box stall that has been well bedded with hay, straw, sawdust, or shavings. After the chloroform inhaler has been adjusted in the manner already described, a good, strong, well fitting halter is put on over the inhaler. Halter ropes or straps are snapped into the side rings of the nose piece of the halter, and two capable assistants—one on each side of the patient—are stationed near the animal's shoulders to manage the ropes. The method of adjusting the halter and side ropes is emphasized for the reason that the placing of a rope directly around the neck for the purpose of control, is likely to exert pressure upon the trachea to the extent of interfering with respiration—especially at such times as it may become necessary to guide the patient during the stage of excitement. It always should be borne in mind that chloroform anesthesia coupled with an embarrassed respiration may prove to be a fatal combination. The anesthetic is administered in the same manner as in the recumbent position. While some patients exhibit little excitement and may gradually sit down upon their haunches and finally rest upon their sides, others may walk or trot in a circle for a while, or even rear up, before going down. The assistants at each side of the animal control it by means of the ropes attached to the halter. The patient is completely anesthetized in a very short time after going down. This method is advised when conditions prevent forcible casting, and is especially recommended in cases of difficult parturition in which a general anesthetic is indicated.

A few years ago a well known Michigan veterinarian devised a method of producing chloroform anesthesia which was described as follows in Veterinary Medicine:

"This method of chloroforming a horse was new to most of the veterinarians present, and in practice proved very rapid and as effective as any of the slower methods.

"For this method of chloroforming, a sponge was saturated with water and then squeezed as dry as it conveniently could be with the hand. One nostril of the horse was thoroughly coated inside and out for some distance from the muzzle with vaseline and then the sponge was placed in the nostril and about one ounce of chloroform poured into it. Then by alternately holding the hand over the opposite nostril and releasing it, the horse is compelled to inhale through the sponge and allowed to exhale through the open nostril. Chloroform was added to the sponge from time to time as appeared necessary. As soon as profound anesthesia was reached, the open nostril was left free and the animal of course carried on the greater part of its respiration through this nostril. Apparently the amount of chloroform received from the sponge in this way, was just about sufficient to maintain the anesthesia.

"When the operation was completed the sponge was removed from the nostril and recovery was exceedingly rapid. The originator of this method has used it in some hundreds of cases with an exceedingly low percentage of mortality."

The foregoing method has been criticized by those who believe that in the event of unvolatilized chloroform trickling through the sponge into the nasal chamber, unfavorable sequelae, such as rhinitis, bronchitis, inhalation pneumonia, and other undesirable complications involving the respiratory tract, might be brought about. Personally, we have had no experience with this method, and assume no responsibility in referring to it.

Time Required to Induce Anesthesia

Regarding the time consumed in inducing chloroform anesthesia in equine patients, we quote the following from one of the best known surgeons of the Middle West: "The large majority of writers on chloroformization, both European and American, elaborate especially upon the time it requires to bring a horse to the surgical stage of anesthesia with chloroform. The required time usually given is from 15 to 40 minutes. The shortest time recorded by

Moller is 7 minutes in a four-year-old horse with 35 grams of chloroform, and the average among 126 patients—stallions, geldings, and mares of all ages—is from 18 to 22 minutes. These statements seem remarkable to me in view of the fact that it never has taken me over three minutes to bring a horse to the profound stage of anesthesia, and in many instances not over 30 seconds. As the discrepancy of time is due of course to the different methods of administration, the question naturally arises whether the slow method has so much advantage over the rapid method as to warrant the loss of so much time, or in other words, is the slow method the safer? There are of course occasional deaths from chloroforming domestic animals, but in the horse they should be few and far between no matter what the method of administration is. The horse that is subjected to operative treatment is in 99 per cent of cases in good general health. Organic diseases of the heart are rare; he responds to a comparatively small amount of chloroform; he never has that narcotized condition of the nervous system caused by alcohol, morphia, and other narcotics which in the human make chloroformization both difficult and dangerous, and finally the veterinary surgical operations are relatively of short duration. With all of these advantages in our favor the dangers are indeed scarcely worth mentioning. So, therefore to labor over a patient 20 to 40 minutes, is taking an unnecessary precaution."

On the other hand Hoare states that "We must be careful to avoid undue haste, both in the administration and in commencing the operation before a proper stage of anesthesia is induced. The average period of time is from 10 to 15 minutes."

Chloral Hydrate Anesthesia

Chloral hydrate is employed as an anesthetic under certain conditions and has proved to be very satisfactory. In cases in which the administration of chloroform is contra-indicated; in emergency cases when chloroform is not obtainable, or in cases in which in the opinion of the operator profound anesthesia is not called for, its use is especially indicated. Painful and often quite serious operations are accomplished under the influence of this drug. Ridgling and "roaring" operations are performed to much better advantage under its influence than upon the unanesthetized patient. Operations upon fistulous withers, poll evils, schirrous cords, and fibrous tumors are included in the list of procedures that may be carried out under chloral hydrate anesthesia. Several of the operations enumerated can be performed in the standing position in which case the application of a "twitch" may be required to assist the action of the drug in controlling the patient. While many practitioners administer chloral hydrate in capsules with good results, this method is not advised because of the possible danger of the capsule becoming broken or crushed by the teeth, and thus allowing the undiluted drug to come in contact with the mucosa of the mouth, pharynx, and esophagus during the act of deglutition.

The dose of chloral hydrate is from one to two ounces. The drug must be fresh and should not have been exposed to air or strong light. It should be dissolved in not less than one quart of hot water, and properly cooled before its administration which should be about one hour before the operation.

Given prior to "roaring" operations, chloral hydrate has proved to be remarkably efficacious. The sites of the tracheotomy and laryngotomy incisions are cocained. The patient is backed into a single stall, a dental halter is adjusted and the head tied so as to prevent lateral movements. Tracheotomy always should be performed on account of the danger of either edema, or spasm, of the glottis which in the absence of a tracheotomy would result in partial, or complete suffocation. The McKillip tracheotomy tube, which can be inserted through the tracheal ligament without cutting or otherwise injuring the cartilages, should be used. Even while removing the membrane lining the ventricles of the glottis, the patient appears to be indifferent to pain, and quietly submits to the entire procedure.

It is not the intention at this time to give a description of the surgical technic of the "roaring" operation. It has been cited merely as an example of what can be performed under chloral hydrate and cocain anesthesia.

The losses of baby chicks from bacillary white diarrhea can be lessened by providing sanitary quarters and the administration of intestinal antiseptics. Sour milk or buttermilk appears to be of special value in controlling this malady in chicks. Thus, this disease is apparently not so difficult to control in young chicks but no reliable method has been found to eliminate the infection from older birds that are carriers. Various methods of treatment to eliminate the infection from carriers have been used such as intestinal antiseptics, vaccines, bacterins, etc., but no treatment has been found successful.

Co-operation of Veterinary Officials Among A Group of States*

E. I. Smith, Nashville, Tenn.

The few remarks I will make in this paper are the results of my own observations. I have not discussed the subject with any federal or state official, but the following suggestions are commended to the reader for consideration.

It requires united effort to accomplish something worth while. Consequently, if small sums of money are being expended on any project, much greater results may be expected if a group of co-operating officials exert every possible effort to advertise the results of a set program. There is a pride in a little being done exceedingly well; besides, it paves the way toward results the following year. It should not be the program to attempt to establish any spectacular record, but to create normal public sentiment in a merited project.

Annual meetings of state, federal officials and others would be a splendid force toward informing the people what it means to keep our domestic animals free from disease. It is not difficult to draw a vivid imagination of what the public health would be if diseases of animals were ignored. As previously emphasized, meetings should not be held with the expectation of any sensational results, but to seek uniformity of regulations and produce a growing efficient system.

The conferences which are suggested by this paper might be held annually and in conjunction with one of the state or sectional veterinary medical meetings. Opportunity would then be offered to hear from progressive stockmen who are seeking to improve the welfare of the live stock industry. If veterinary medical associations confine their discussions on contagious and infectious diseases to professional ranks alone, slow progress will be made. It is beyond contradiction that when a project is commenced to control a widespread disease, public confidence must first be secured. Consequently, at every opportunity, open the doors of truth well in advance of any anticipated call. The more mystery entertained by the public, the greater the amount of antagonism which will block the way. Doubt and ignorance must be eliminated before perfect co-operation may be obtained.

The veterinary profession has an opportunity to become an important factor in shaping the affairs of state medicine. The control and eradication of animal diseases which are transmissible to man, is largely a veterinary problem and must be handled and seriously considered by the veterinarian. It is an issue too important for a class of veterinarians alone to combat. In contemplating a program toward creating greater familiarity in regard to the control of animal diseases which menace the human family, all state officials who are connected with health and sanitation should be invited to participate.

In 1921 the New England states decided to have a conference of veterinary authorities, including practitioners, state and federal veterinarians. The meeting was called to meet with the Maine State Veterinary Medical Association in the summer of 1921. It was pronounced by all present to have been a colossal success, the spirit of good fellowship lived long, and every year since the same group of states has held a similar conference at points in one of the various states, and each meeting has been highly praised. Governors and other distinguished state officials have gladly taken part. The effect has been phenomenal to the extent that the citizens of New England understand more of the value of the veterinary profession. The practitioner is a part of the program and is an important factor in state medicine. A Connecticut practitioner worked out many details of the intradermal test and his observations have been adopted as a standard. In explanation, let me say that this veterinarian perfected details of the test in his general practice and kept accurate records of his observations. No organization offered him a reward. His only reward was the fees from his practice and the satisfaction of being able to perfect a system.

In the character of meetings referred to in this paper, it may be expected that men will differ and it is natural for differences to arise, but out of these normally discussed opinions, chaos will disappear and uniformity be established. Just for comparison, permit me to quote a few figures.

*Read before the Tenn. Vet. Med. Asso., Chattanooga, Tenn., July 21-22, 1924.

In May, 1924, a group of six New England states tested 44,198 cattle, embracing 2,508 herds; 3,114 reactors were found. In May of the same year, a group of nine Southeastern states tested 42,480 cattle, embracing 8,374 herds; 376 reactors were found. Three more states participated in the Southeastern group than in the New England group; 2,738 more reactors were found in the New England group.

It is not the intention to array one set of figures against another, but it gives an opportunity to study conditions and permits the student to ask a candid question: Why this difference?

Turning back to Tennessee. In regard to accredited herds, may I say that from January 1, 1924, to July 15, 1924, thirty-three herds, embracing 1,270 cattle, have been tested by accredited veterinarians. A large number of accredited herds have been turned back, but a large number are not as yet due for the test by the accredited veterinarians, and many of them, by reason of neglect, have fallen and will fall by the wayside. The number of herds tested has not been comparatively large, yet it is gratifying to know that the veterinarians have been interested and fair; likewise, each owner has been satisfied.

Whenever an accredited veterinarian tests an accredited herd and the chart reaches our office disclosing no reactors, the owner of the herd receives a renewal of his certificate. The State Veterinarian has adopted a plan authorizing us to furnish the owner with a gold seal certificate to paste on his original certificate, which extends the accreditation one year from date of expiration of the old certificate.

The eradication and control of any animal disease is more and more coming to be a cooperative issue. All forces must rally to one cause.

Items of Interest to the Practitioner

By A. T. KINSLEY

T. H. Edwards of Pasadena, Cal., is Director of Rabies Control of the Health Department of Los Angeles County. The doctor has reported that there are approximately 50,000 dogs in Los Angeles County; that there were 808 positive cases of canine rabies in 1923 and that nine humans died of rabies induced by the bite of rabid animals.

The Council of Denver, Colo., recently adopted an ordinance requiring dairymen selling raw milk in the city of Denver to file a test chart on and after July 1st, 1925, with the city health officer, showing that all cows supplying milk have been tuberculin tested and found to be free from tuberculosis.

Stomach worms in sheep can be reduced to a minimum by repeated doses of one per cent solution of copper sulphate.—Nighbert.

It has been reported that potassium iodid in repeated doses controls nodular disease in sheep. A definite report from a practitioner on this method of treatment will be of very great value.

Rabies is very prevalent in many sections of the country at the present time. The loss of four two-year-old steers in one herd has been reported by Dr. Roy Morgan of Skidmore, Mo., and Dr. J. F. Stockard of Lees Summit, Mo., has given the anti-rabic treatment to four work mules on one farm.

The single injection vaccine preventative treatment is being extensively used in attempting to prevent the spread of the disease in dogs and cats. The length of immunity produced by this method of vaccination is still an open question. There has been one case of rabies reported in a dog that had been given a single dose of anti-rabic vaccine about two months prior to the time that the disease developed.

No doubt, the single injection method will give protection, at least according to experiments. If the vaccination will give an immunity for even one year, it is worthy of extensive use particularly in infected areas. Assuming that this vaccination does produce a temporary immunity what will be the results of long continued use of the method of control of rabies? Will the virulence of the disease be reduced and may the virus become attenuated to produce a mild non-fatal attack of the disease in some cases? These are problems that concern not only the sanitarian and veterinarian but also the mass of the population.

Various theories of immunity and processes of immunization have been discussed and published in practically all periodic medical journals and non-medical journals. Recently, Besredka, of the Pasteur Institute of Paris, France, has championed the theory of immunization by the introduction of the protective agent through the same route or tissue that the virus is introduced in natural infection. Thus it has been apparently demonstrated that anthrax bacilli can be introduced with impunity into the peritoneal cavity, trachea or other tissue of the guinea pig, provided the skin is not broken. In other words, according to the theory, in the case of anthrax the skin is the vital point of injury and infection with the B. anthracis; likewise it is assumed that an immunity to anthrax in these experimental animals can be produced only when the antibodies or vaccine is induced into the skin. On the same lines of reasoning, it is assumed that typhoid vaccination would be more effective by ingestion of the vaccine or antibodies.

These theories and experiments are extremely interesting and may in time turn the tide of the present process of immunization.

The prevention of goitre is being systematically waged in some states, noticeably Michigan, in which all salt manufacturers are incorporating sufficient iodin in table salt to protect against all cases of simple goitre.

In 88 cities and villages in New York State, over 40,000 children were supplied with milk at the mid-morning recess during the school year.

According to the press, a horse was recently transported from Paris to Amsterdam, by airplane.

The cost incident to disease and death in the human in the United States is approximately three billion dollars annually.

Hydrogen sulphid when in sufficient concentration is one of the most toxic gases. The rapidity of the toxicity of hydrogen sulphid is comparable to that of hydrogen cyanid. The exact mechanism of hydrogen sulphid poisoning has not been determined.

The primary etiological dietary factor in pellagra is a faulty protein mixture, a deficiency in some as yet unrecognized dietary complex (possibly a vitamin), or some combination of these. Fresh meats and milk contain the essential pellagra-preventative factor or factors.—U. S. Public Health Service.

A twentieth century invention for the benefit of the equine gentry is now available. This new invention is now in use in some of the larger stables in Kansas City and consists of a vacuum cleaner that replaces the curry comb and brush. This process of cleaning the horse is more efficient and is less expensive than the old method and Dobbin apparently enjoys it.

Welch, of Johns Hopkins University, has apparently demonstrated that the blood of a human that has recently recovered from chicken-pox contains sufficient antibodies to be of value as an immunizing agent. This treatment was given to nine exposed babies and the disease developed in one, the other eight showing no signs of the affection.

The occurrence of goitre in pigs has recently been reported from various sections in Wyoming. Several farmers have lost heavily of their spring farrow from this malady. Goitre is the easiest and simplest of all known deficiency diseases to prevent. The administration of iodin in some form during the period of pregnancy prevents the occurrence of goitre in pigs. This treatment is inexpensive as the dosage required is relatively small and can be administered in the feed.

According to the most reliable statistics, the death rate in the human caused by the injection of diphtheria antitoxin is one to seventy-five thousand. These deaths are due to anaphylaxis. There is a marked difference of the sensitizing effect of horse serum injected into humans. One case of anaphylaxis occurring in a child and induced by riding or driving a horse has been reported in which the reaction was indicated by congestion or inflammation of the conjunctival and nasal mucosa and was manifested by red eyes and nasal discharge.

Vitamins have usually been considered as substances similar to or at least comparable with enzymes and toxins, particularly as to stability and results of the activity of small quantities. Seidell, of the United States Public Health Service, has apparently demonstrated that a definitely crystalline insoluble picrate compound derived from brewers' yeast possesses a high degree of antineuritic activity. The fact that it is apparently possible to as-

certain the chemical nature of one vitamin, is of very great importance as it indicates the possible determination of the chemical nature of others and we may hope for the synthetical production of these very important substances.

Dr. Felton, of the Harvard Medical School, has devised a method of precipitating and concentrating the antibodies in antipneumococcus serum. The concentrated antibody solution thus prepared has been used with encouraging results in over fifty cases of pneumonia. Antipneumonic serum is of equine origin and usually has a relatively low antibody content and is prone to produce a violent reaction when injected in the human. The objectionable features of the original antipneumococcus serum are eliminated in processing according to Felton. If the general use of the precipitated concentrated antipneumonic serum proves as successful as the experimental demonstration, Felton will stand as a scientific peer.

Fur Farming as a Live Stock Industry

By C. B. Shore, Secretary and Veterinarian, Rest Island Silver Fox Farms, Inc., White Bear Lake, Minn.

It is indeed gratifying and a pleasure to the writer to have the opportunity of again conversing with my colleagues upon a subject that is of interest to young and old, concerning an industry that is rapidly spreading throughout the Northern, Central, Eastern and Western portion of the United States—an industry that is founded on the basis of human needs and desires, and one that in the future must be given careful consideration by the population of these sections of our country if they would insure the future fur supplies of the coming generations.

It is not difficult to realize that the wild fur bearing creatures that once roamed our native

Reynard at Home Amid the Haunts of Civilization

woodlands are rapidly becoming extinct as a result of civilization's rapid progress. The muskrat that once inhabited our streams and marshes with his houses of rushes, the mink that traversed our wooded streams, the beaver of our north woods, the deer and the buffalo that used to rove our native plains have vanished or their numbers have alarmingly decreased. With the advent of the automobile the desolated wooded regions into which these few remaining animals of wealth have retreated, have been invaded by the hunter and trapper until but a few more years remain until even the few remaining species will be extinct.

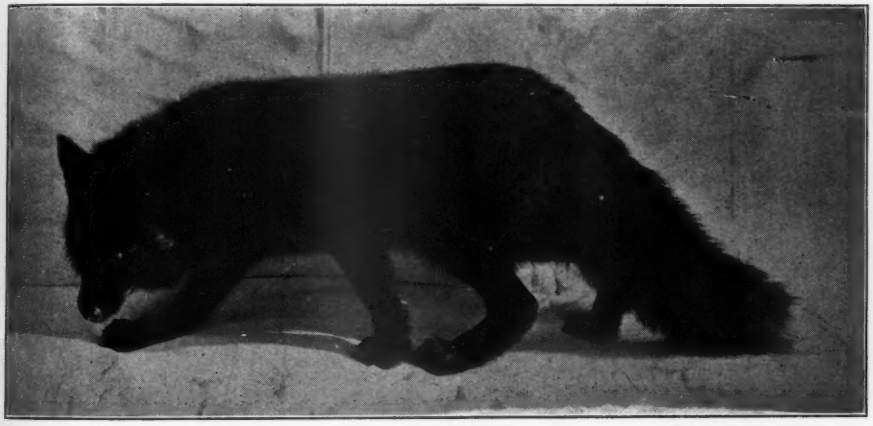
Many will ask, "Of what importance is this to us?" The importance is indeed great in as much as man's chief garment since the dawn of ages has been fur, his chief adornment fur. With the passing of our fur bearing animals, is it not man's chief concern as to where his future supply shall come from? Conservation of those few remaining species and the bringing of these animals to the civilized haunts of man must be the answer.

Already a catastrophe has been foreseen and today there is being produced throughout the different sections of the United States the pelts of the wild fur bearing creatures which once were so plentiful.

There is, perhaps, none being produced under these conditions that possess the distinction and command the values of the silver fox. Minnesota, the state from which the writer hails, is known the world over for her products of wealth which include flour, iron ore, wheat, agricultural products, while foremost in the list of products stands silver fox. Existing already within her boundaries are numerous, prospering silver fox ranches. Many years of hardship and costly experience were encountered to produce such results, but these encounters have all been successfully overcome and silver fox farming has been placed among the leading industries of livestock production in the United States, and is recognized by our government

as a legitimate, interesting, and profitable enterprise.

Silver fox farming has been engaged in for many years, originating in Prince Edward Island, Canada, spreading gradually into the United States. During the period of introduction, breeding stock commanded fabulous and exorbitant prices, due to the fact that the pelt of this animal commanded very high prices when placed upon European markets, from whence it was purchased and worn exclusively by the nobility. As time advanced, prices declined accordingly, until today silver fox farming has established itself upon a solid commercial basis.



A Choice Specimen of Silver Fox

In view of the fact, however, that the silver fox pelt is one that cannot be imitated, it is considered among the most valuable furs in the world and when placed upon the market, good quality pelts command high prices, which tends to make the industry interesting and lucrative.

One of the principal reasons why more people have not entered into the silver fox industry is the fact that the industry has not been brought to their attention, another is the capital required to engage in the venture. For these reasons silver fox farming is yet in its infancy. Some are of the opinion that so many will become engaged in production that future markets will be over-supplied. But when consideration is given to the fact that fur cannot be raised in a warm climate, that the whole world is a market for fur, there is little cause for alarm among the breeders. Quoting from Major Lampson of the London Fur Sales, while he was in attendance at the National Silver Fox Show held in Milwaukee last year: "The time will never come when a good silver fox pelt will not be in demand." He further stated he could dispose of all the pelts of the foxes exhibited at the show last year in two hours' time. Approximately 500 foxes were exhibited. The best efforts of the present breeders of silver foxes could not supply the market demands for many years to come should an advertising campaign be launched in behalf of the silver fox pelt.

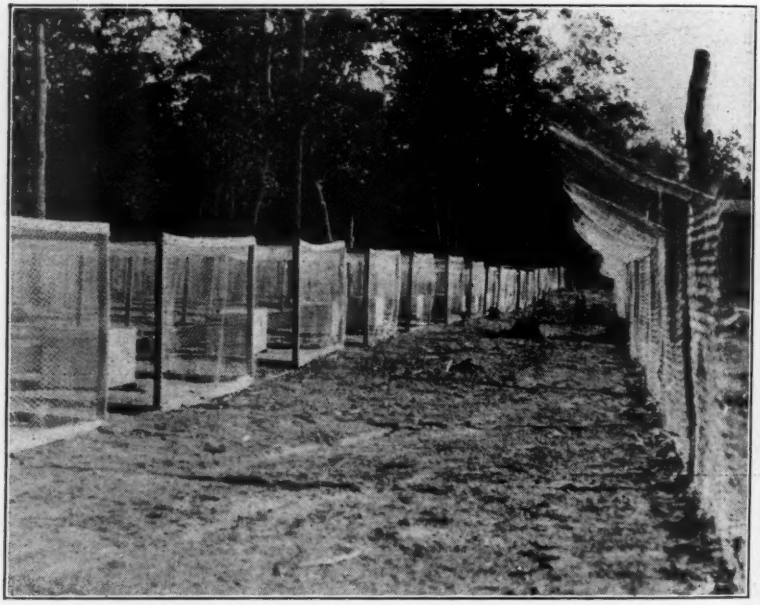
When one starts to figure the profits of silver fox farming, there is absolutely nothing of like character that can be compared with it. By this I mean, the production of other live stock, fruit growing, or almost any manufacturing or commercial enterprise. Of course there are a number of speculative propositions in which the element of chance is the main factor that once in a while will produce exceptional profits, but with these the chance of total loss is also very great. With fox raising it is entirely different. Chance does not figure to any great degree and if started right there is at all times a most tangible asset on which may be realized year after year more than the initial investment.

The successful farmer of today has primarily to be an educated man. By this I do not mean a university graduate, but even though he should be, that fact will do much to help him in his work. What is meant by education, is that he should be sufficiently intelligent to quickly grasp and put into execution the numerous scientific

ideas that have done and are doing so much to make the farm a far better one than that of his predecessors. Science has figured in farming to such an extent that no one conducting a farm at the present time would think of conducting it on any other principle. Old worn out farms, abandoned many years ago, are today made to yield record crops through the appliance of scientific principles. Raisers of live stock find they can raise more and better animals than was formerly the case when hogs, cattle and horses were treated alike as far as raising them was concerned.

the field of such production in some manner, in addition to the crops he already produces. The successful farmer when he finds that any one branch of his business does not pay, is quick to replace this non-productive branch by one that does and as the fur industry continues to increase he will see many things he is now giving his attention to on the farm that could readily be dispensed with, and in their stead a fur ranch will be installed from which many times greater profit will be made annually.

So it is with you, my fellow practitioner. Who is better fitted to scientifically care for



Breeding Pens at Rest Island Silver Fox Farms

The farmer is now having his attention directed toward the raising of fur bearing animals through the efforts of the government and others interested in the welfare of the industry. To those already informed on other lines of agricultural procedure, this form of farming is somewhat of a departure and at first does not appeal to all, but the farmer of today being in the main a first class business man, cannot long keep clear of engaging in the industry. The more he studies the situation, the more he will and as profit is that which he is seeking, it is become convinced of the profits to be made, safe to conclude that sooner or later, he must realize the benefits of the industry and enter

and feed these animals than you, understanding as you do the physical structure of the animal itself? The fur industry is growing rapidly by leaps and bounds. Already a number of your colleagues are actively and successfully engaged in the venture. Every year that passes conclusively proves that everything favors the production of fur bearing animals in captivity and those engaged in it have a wonderful opportunity to make large returns. Not only our own government but other governments are thoroughly convinced that the time is rapidly approaching when fur bearing animals in the wild will become entirely extinct and in order to conserve the furs that are already in so great

demand, these animals must be perpetuated through fur farming.

In the development of all lines of the live stock industry certain fundamental features must be taken into consideration, in order that a definite end or purpose be accomplished. The breeder in order to secure these desired ends must give due consideration to the principles to be applied. But this, my reader, is another story which I shall be glad to give you at a later date should you be interested in reading further data regarding our interesting vocation.

The Horse*

By D. M. Campbell, Chicago

Since there are now in existence about 4,000 books dealing exclusively with the horse and since until the last decade a preponderance of veterinary literature dealt exclusively with this animal, it should be no great task to confine myself to the subject assigned by your secretary.

We are told in Holy Writ that God gave man "dominion over the fish of the sea, and over the fowl of the air, and over every living thing that moveth upon the earth." It is a matter of interest to us that among the first over which this dominion was asserted was the horse, and since the early paleontological records of man, we find him a constant associate of the horse.

As horses came out of Asia and followed the receding ice caps across Europe, tens of thousands of years ago, so man came out of the same continent and followed the horse. The earliest records of the horse's subjugation by man are those of their mingled bones in the caves of Europe, which shows that at an early age the horse was one of the principal sources of food of our progenitors.

As man advanced in civilization, we find the horse less a source of food than a means of transportation for nomadic and pastoral peoples; and still later, in the evolution of civilization, when man took up something of a settled residence and engaged in agricultural pursuits did he turn to the horse for a source of power.

Throughout the period of recorded history, the civilization of peoples has been in the main just in proportion to the extent to which they used the horse, and among the horse-using nations civilization has been in the degree to which they used the horse for food, transportation and power. It is only during the present generation that this long, long record is subject to revision and that we now find civilization and industry in a measure proportionate to the extent to which horse-power has been supplanted by mechanical power.

When the first railroads were built through the settled and unsettled portions of our country, those were not wanting who predicted that they would mark the ruin of the country, since by revolutionizing transportation with the horse, a large number of those engaged in his care and use would be thrown out of employment. Still later, when the horse was supplanted in our city and interurban transportation systems by electricity, again the doleful prophecy was made that because of the hundreds of thousands of horses and workmen that were displaced in this way, ruin of the country would surely follow.

But it didn't. And, now that there are 16,000,000 passenger automobiles and trucks on our streets and highways, it might seem indeed that we had arrived at a horseless age. But the report of the Department of Agriculture shows there are more horses and mules in the United States now than there were twenty years ago, and I think it is a safe prediction that notwithstanding the progress of invention and the extension of mechanical appliances to more and more uses, the number of horses and mules in America is not likely to decrease.

Surely if the number of horses has increased in spite of the invasion of their field by steam railways, electric railways and by automobiles, we can scarcely conceive of anything that will supplant the horse.

The plans of the War Department at Washington, I think, are as up-to-date as it is possible to make them and the Department looks as far into the future as it is possible for any organization to look; nevertheless, their present plans for the defense of the United States, which as you are no doubt aware, provides for six field armies, calls for 400,000 horses for the use of these armies—a greater number than Napoleon used at the height of his power, more than one hundred years ago. It would seem likely from this that in war as in peace, the horse is not soon to be supplanted.

* Presented at North Carolina Veterinary Association meeting.

That the increase of horses has not kept pace with the increase of industry and population of the country is, of course, true; but what is of more importance to veterinarians is that the increase in horse practice has in no way kept pace with the increase in horses; but on the contrary, veterinary practice among horses has decreased very largely in the past twenty years.

For this there are two causes as I see it. Over one of them we have no control. The other is within our power to remedy and therein lies the practical phase, if there be one, in a paper such as this.

Before the advent of the passenger automobile, horses from pretty much every farm in a community would gather together in the towns on Saturday afternoon where they universally swapped diseases one with another. These horses then took home the new acquisitions in the way of diseases and proceeded to generously share them with the other horses on the farm. Now, every farm is virtually a quarantine station where animals may be reared, spend their lives and die without coming into contact with others of their kind unless they be shipped to market. This has occasioned a loss in veterinary practice.

Before the automobile truck came into popularity, long and hard drives were the rule with city horses. Those of you who can recall city practice of as much as fifteen years ago, remember that it was the tired and overworked horse that suffered from lameness, colic, pneumonia and other ailments that went to make up the bulk of veterinary practice.

Now, that horses are used for short hauls and light loads, exhaustion is an ailment little unknown to city practice and the manifold ills that followed on the trail of exhaustion have likewise disappeared. Paved streets and alleys and roads have lessened the number of nail pricks.

Further, the increased cost of feed has made horse owners more careful in this respect, with a large reduction in intestinal ailments, and perhaps also in azoturia.

Veterinarians, of course, have naught to do with the foregoing factors in the decrease of veterinary practice; that is, the lessened exposure to infectious diseases, the lighter work for horses, and more intelligent feeding. But with another cause for a decrease in horse practice, we veterinarians are ourselves responsible. I refer to the tendency in the past few years to neglect and even discourage equine practice.

This was particularly noticeable in the hog growing sections some few years ago where the returns for the vaccination of hogs was so much higher than what could be had from calls to treat horses that many veterinarians deliberately avoided horse practice, with the result that anyone could have foreseen, that horse practice diminished, to the loss of both the veterinarian and the horse owner.

Our veterinary schools and our veterinary associations have not been blameless in this matter. To cite a single example. Last winter I attended a combination of a state veterinary association meeting and a conference at a state veterinary college. On the program for the clinic was a discussion of the operation for fistula. The clinician is admittedly one of the best half-dozen veterinary surgeons in the whole country, yet the whole burden of his discourse and the lesson of the splendid specimens hardened in formaldehyd that were exhibited and sectioned in various planes, was that fistula of the withers is an ailment exceedingly difficult to help by surgical procedures and that on the whole, the advice to give the owner when an animal had a fistula was to get rid of it, and the advice to those present was not to operate.

And this, notwithstanding one of the leading members of the association present at the meeting had practiced almost in the shadow of the school for nearly forty years, and during all that time operations for fistula constituted a considerable portion of his practice and in recent years might be said to be almost a specialty with him. I submit that if his treatment for fistula had not helped his cases and had been unprofitable to the owners of the animals, surely in a period of forty years, they would have found it out, and his practice of this nature instead of increasing in the last decade would long ago have disappeared.

There are many sections of the country where the practice of the veterinarian is almost exclusively dairy practice. We find swine practice with these men is unimportant and they cannot see that the hog offers an opportunity for veterinary practice. There are other sections where we find swine practice making up the bulk of the veterinary practice, and veterinarians in these localities do not see the possibilities in dairy practice all around them, but when hogs are cheap and cholera scarce, they bewail the reduction of income.

In every locality I think the sort of practice that the veterinarians do is the kind of practice that they have cultivated—practice they have prepared themselves to perform intelligently

and profitably for the owners of the animals. Like other professional and business men, veterinarians are prone to follow fads, and I feel pretty sure that the man who makes a fad of swine practice, sheep practice, dairy practice or small animal practice, will in a greater or lesser degree neglect all other practice; and the practice that he neglects will speedily fall away from him. While on the other hand, the veterinarian who assiduously cultivates every opportunity that he has to administer to the needs of any domestic animal and does this profitably to the owner of the animal, will find his practice not only keeping up to what it has been in the past, but increasing year by year.

It is worse than unprofitable to bemoan the passing of the horse and to class equine practice as a liability on our books. Far better to realize that three are 26,000,000 horses and mules in the country and that they need veterinary service, the very best veterinary service that can be given them and to prepare ourselves to render that service and to cultivate and encourage that kind of practice.

Porcine Orchitis a Sequel of Vaccination

By A. T. Kinsley

Orchitis is not a common malady in swine. Practically all cases that have been reported occurred in breeding swine. The most common cause of orchitis in breeding boars has been due to excessive use and a general disregard of sex hygiene. An occasional case of orchitis in swine has been caused by the B. abortus and some few cases are due to the tubercle bacillus.

Veterinarians in meat inspection service occasionally report the findings of tuberculous lesions in the testicles of boars slaughtered at abattoirs. Some inquiries have been received from practicing veterinarians indicating the occurrence of orchitis in boars after vaccination with anti-hog cholera serum and virus. One case was of particular interest in which a valuable pure-bred boar was treated simultaneously with anti-hog cholera serum and virus when about six months of age. This boar was found later to be a very irregular and uncertain breeder due apparently to an orchitis that occurred soon after the vaccination.

Recognizing the significance of the possibility of inducing an orchitis in breeding boars by the use of anti-hog cholera serum and virus, several inquiries have been made as to the frequency of this condition succeeding vaccination.

Dr. R. E. Watkins, who is at the present time employed by the Kansas City Stock Yards as chief for the vaccination of stock hogs, was consulted in this matter and he reports the vaccination of a carload of boar pigs, weighing from 100 lbs. to 125 lbs. with anti-hog cholera serum and virus, and the occurrence of orchitis in practically every case within a few days after vaccination. This particular carload of pigs was purchased in the public market, there being a few obtained and vaccinated each day until the entire carload of some 150 head had been obtained and vaccinated. The time required to accumulate this load of pigs was about two weeks. The doctor reported that in practically every instance each pig vaccinated developed a severe case of orchitis or epididymitis three or four days after vaccination. In talking with a hog feeder he stated that several instances had come to his attention in which orchitis had developed afer the simultaneous vaccination. In many instances this feeder stated that the reaction succeeding the inflammatory process was so intense that the pigs were permanently stunted.

The usual symptoms evidenced in the cases of involvement of the reproductive gland of the pigs succeeding simultaneous treatment with anti-hog cholera serum and virus consists of enlargement and an increased sensitiveness of the glands. The affected pigs have little tendency to move and have a diminished appetite or inappetence. The inflammatory process usually subsides in a few days, after which the testicles atrophy in most instances. An occasional case is observed in which there is abscess formation succeeding the inflammation and in which the testicular structure is destroyed. This condition is quite serious in breeding animals as an inflammatory process of any of the sexual structures diminishes the breeding possibilities.

From the general information available, it has not been possible to ascertain the exact cause of the development of the inflammation of the sexual glands in pigs succeeding the simultaneous administration of anti-hog cholera serum and virus. Most of these cases that

have been observed and reported have occurred in pigs in which the serum was induced into the axillary space and the virus in the subcutaneous structures in the flank region, and this would indicate the possibility of secondary infection in the virus, capable of producing an inflammatory disturbance in the lymphatic structures, and simultaneously extending to and involving the sexual gland.

This is given only as a theory, as it has not been positively demonstrated. This brief report is likewise given with the hope that readers of Veterinary Medicine will freely discuss and give further information along these lines.

Karakul Sheep

By J. F. Shigley, Pennsylvania State College

Recently a well known investment adviser stated that fur bearing animals offered a place for investments which would yield gratifying returns. The silver fox industry was placed as an investment which had a relatively high rate of income with a corresponding element of chance owing to losses of valuable animals which might occur. The breeding of Karakul sheep, however, was placed as an investment in which the element of chance was minimized and returns in fur and meat sales comparatively high. It is of interest, therefore, to give some attention to this phase of fur production.

Karakul sheep are known to the trade as "fur bearing." They produce the well known Persian lamb fur; popular alike with men and women of nomad and civilized countries. In America the demand for Persian lamb fur has been on the increase. The importations of raw skins before the world war reached the sum of $14,000,000 annually.

Their native home is in Central Asia in the province of Bokhara, lying between Turkestan and Afghanistan, northeast of Persia. This country is mostly desert land with here and there an oasis. The name Karakul is derived from a lake called Kara-kul or Black Lake. Here the natives have raised these sheep for centuries with little or no attention paid to their improvement through selection, breeding, feeding, or care, the one thought of the owner apparently being to reap a harvest in the sale of furs to the exclusion of every one else. For centuries they have never parted with their sheep in sale or trade to foreigners. The Russian government, in exercising a protectorate control over this country encouraged this policy among owners of Karakul sheep.

The origin of Karakul sheep is obscure. It is believed by Dr. C. C. Young of Texas, who, in 1909, visited Bokhara, that the long-tailed black sheep of Danadar were the original fur-bearing stock of Central Asia. When crossed on the white fine-wooled sheep of Afghanistan the result was the gray Danadar. These gray sheep were crossed with the fat rumped breed resulting in what is known as the Arabi, a broad tailed type, from which the Karakul is descended.

Karakul sheep were first introduced into America by Dr. C. C. Young in 1908. This shipment consisted of three rams and twelve ewes. With but two or three exceptions, these sheep did not produce the tight-curled, lustrous fur which the American market demanded. Having secured letters from President Taft, Doctor Young made trips into Bokhara in 1913 and 1914, and brought the total of the three importations to thirty-one rams and twenty-three ewes.

About this time a number of men engaged in raising silver foxes on Prince Edward Island become associated with Dr. Young, forming the Young Karakul Fur Sheep Company. They moved all of the best sheep and lambs to the island where fur sheep farming was started in America. In 1914 another Canadian corporation, the Agnew Syndicate, brought over a large flock of Karakuls. These, however, were inferior to the previous importations. The climate was unsuited for this industry, as the Karakul sheep is used to a dry climate and severe cold. A holding company was founded and the sheep moved to New York State. By careful selection, breeding, and care, the flock has been built up until today it is the largest and best flock of Karakuls anywhere.

The beginning of Karakul history and breeding in New York State dates back to 1911, when F. E. Dawley of Fayetteville, brought in two pairs of these fur-producing sheep. They were exhibited the same year at the New York State Fair, where they attracted wide attention, being the first Persian lamb fur sheep ever exhibited in America. This flock increased rapidly, and when the American Fur Sheep Registry Association was estabished and incorporated in 1916, these sheep were pronounced the best and healthiest flock of Karakuls on the continent. It was largely due to

the excellent condition of this flock, together with the successful manner in which it had been managed, coupled with ideal soil and climatic conditions, that led to the consolidation in 1916 of the various flocks of Karakuls in Prince Edward Island, New Brunswick, Newfoundland, Nova Scotia, and Alberta, with the one already established in New York State. The bringing of these sheep in from Canada brought the New York flock an addition of one hundred and sixty head. A careful program of selection, breeding, and elimination was instituted and followed, until today this is the best and largest flock in the country.

In 1918, the Karakul flock, which was being bred at Beltsville, Maryland, by the United States Government, was sent to Fayetteville, New York, and here the breeding work is now being carried on and careful records of results are being kept. Thus, New York State not only ranks first as a center for Karakul sheep, but it is recognized also as the logical center from which to carry on experimental and practical breeding work with these fur-bearing sheep that are playing such an important role in the development of the fur-growing industry in this country.

The characteristics of Karakul sheep are briefly as follows: The head, usually horned with the rams and hornless with the ewes, is narrow with a marked Roman type nose in case of rams. Ears are small, drooping; neck long; shoulders prominent, ribs flat; loin high, sloping rump terminating in a heavy, thick, broad, fat tail extending nearly to the hocks. Through the courtesy of the Karakul Fur Sheep Company of Fayetteville, New York, it is possible to present a cut showing a mature Karakul ram.

Karakul Ram

These sheep are hardy, being able to withstand severe winters as well as the intense heat of summer and to subsist upon scanty vegetation. This type of sheep is said to rival the goat in point of ability to subsist on scanty pasture.

Breeders of Karakul sheep agree that not only are they early maturing, averaging sixty pounds at two months of age, but produce a high quality of mutton. The meat is said to have a gamy flavor more like venison than mutton.

The fleece weighs from ten to fifteen pounds and ranges in price from that of native coarse wools to two dollars per pound for the highest

grade wool which is used for the famous Bokhara rugs. The color of most of the wool from mature Karakuls is gray, while that of the lambs ranges from the black at birth to brown up to the time of the first shearing.

"Pure-bred Karakul rams mated with long wool sheep of the Lincoln, Leicester, Cotswold, or Black Faced Highland breeds will produce half-breeds nearly all of which will possess the desired and valuable Persian lamb fur. Selected and tested half-breeds will in turn, when mated to native long wool sheep of any of the above breeds, get lambs which will have fur grading on the market as either karakul, astrachan, or krimmer, all of which possess good money value. It is this feature in the raising and breeding of Karakuls that extends and multiplies their production and popularity many fold, because of the value that can be placed upon tested half-blood and high grade rams when bred to our native long wool ewes to produce lambs with marketable furs."

In conclusion it may be stated that, first, the breeding and raising of Karakul sheep offers an opportunity of fur farming with domesticated animals. Second, the furs from these animals are marketable as Persian lamb, astrachan, krimmer, baby lamb, broad tail, and karakul. Third, the breeding and raising of sheep which can be cross bred with native long wool sheep produce profitable products of fur, mutton and wool.

Helpful Hints in Equine Practice

By L. A. Merillat

UNTOWARD SEQUELAE IN OPERATIONS ON FISTULA OF THE WITHERS

1. In old neglected cases where the lamellar portion of the ligament is diseased well forward and pus tracts extend along the bodies of the cervical vertebrae (cervical fistula), the operation may fail to effect a cure. The neck will remain thick, hard and fistulous.

2. Hemorrhage. The operation is a sanguinary procedure because the incision is long and deep, and if not rapidly executed and especially if very large vessels are not taken up, the patient might suffer from shock and anemia. By working rapidly and by snapping a forcep on the superior cervical artery if it is severed and then packing firmly immediately, there is little danger of serious bleeding.

3. Septicemia. It is important to perform the operation in a perfectly clean manner. The fact that the field is already purulent is no good reason for dirty practices, as new infections are always serious. They may be fatal and always delay cicatrization. Then it must never be forgotten that the practice of wadding a cavity tightly and retaining the wadding with sutures is always attended with the danger of such serious anerobic infections as malignant edema or tetanus. We avert serious consequences by operating in a clean manner and then open the wound at the end of twenty-four hours to release the incarcerated tissues and admit air to the interior of the wound. Fairly clean surgery and the free admission of air to the wound twenty-four hours after the operation, prove effectual in preventing the development of anerobes.

4. Ewe-neck. Some care is taken not to recklessly cut away too much of the connective tissue of the mane as the neck may sink down and leave a rather unsightly animal. For this reason we incise to one side and thus leave the support of the mane untouched.

5. Recurrence. Like all other operations, radical operations for fistulae are not 100 per cent successful. It should not be a surprise if occasionally a case proves stubborn. When the spines of the vertebrae are slow to exfoliate, the process of healing of the soft tissues may outpace that of the bones and thus leave behind seeds for further trouble. That is, the soft tissues will heal over unhealed bones. If stumps of bone protrude through the growing granulations, it is well to use astringents to delay healing rather than to encourage a too hurried filling up of the cavity. Recurrences are, however, very rare where there is a fairly good after care given.

6. How long will it take to effect a cure? There are still men among us who report cures of fistula of the withers in four weeks by the simple process of drainage and the use of bacterins. With this kind of speed, we are unable to compete because the large wound of the

radical operation cannot possibly rid itself of remaining dead element, fill up with granulations and then cicatrize into a mature scar in so short a time. At the end of four weeks, however, the patient is on the "high road" to recovery and every week thereafter brings it closer and closer to the goal. At eight weeks a smiling owner drops in to pay his bill. If the neck is still not safely ready for the collar, there is no disappointment because the patient looks and is cured.

SANGUINEOUS SACS AND VENTRAL HERNIA

Recent traumatisms of the abdomen must always be very cautiously judged. What may at first seem to be only a superficial contusion with an accumulation of serosity or blood, might after the masking swelling has disappeared prove to be hernia. The pathognomonic symptoms of hernia (the orifice or reducibility of the contents) may be obscured by swelling during the first ten days, and even later when ventral hernia is complicated with a serous or bloody collection, it may be difficult to arrive at a safe decision as to the exact nature of the injury. To hastily lance such sacs is a dangerous practice, because such a large cavity, with an external opening, cannot easily be prevented from becoming infected, and if a hernia exists, peritonitis will certainly follow.

Some years ago the writer found an assistant working over an abdominal contusion he had been treating for several days. Believing it to be a sanguineous sac, he had lanced it and evacuated a quart or more of serum and had dislodged a few large blood clots with the finger. While preparing a wadding for the orifice, a mysterious looking string of tissue began to protrude. Examined, it was found to be blood-soaked omentum. This pitfall is not difficult to avoid if the diagnosis of all abdominal bruises is withheld for a week or two.

COLIC FROM STRANGULATED HERNIA

Colic in stallions or even in geldings is sometimes caused from inconspicuous oscheoceles, and the veterinarian who treats such a case hour after hour unconscious of the real cause of the trouble always exposes himself to criticism for not having discovered the condition before remedial measures were useless. It is mighty good practice to examine the inguinal region in all stubborn colics and in all colics of stallions, and when there is any evidence of hernia the suspicion should be promptly confirmed or excluded by a rectal exploration. No matter what course of treatment is decided upon after an early diagnosis of hernia is made, the practitioner's reputation will not suffer if the patient dies.

Consultations over stallions with strangulated hernia are very common events, and in every case the announcement that it is now too late to operate successfully always reflects seriously upon the practitioner who failed to recognize the character of the ailment earlier.

New-born Colt with Lactating Mammary Glands. Photos by Dr. E. A. Hays, Lake City, Iowa. The colt was owned by one of his clients at Lanesboro, Iowa. It was two days old at the time the pictures were taken, and Dr. Hays states it gave a good flow of milk at the time of birth, the lactation lasting about a week.

Post War Development of the Army Veterinary Service

By Robert J. Foster, Major V. C. Ft. Riley, Kansas

To have an army veterinary service devoid of any semblance of organization change into a thoroughly organized veterinary corps in a period of five years is what the present members of our profession have been able to see accomplished and to a great extent participate in the making.

In the making of any organization it is always necessary we bring forward the great drawbacks and uselessness of what is on hand, if a change is to be made. For years our professional journals devoted a great deal of space outlining the inadequacy of the pre-war service and one who would read the files of these journals or even recall what has been written could only believe that the army veterinary service was in a deplorable state. While there is still much to learn and many improvements yet to be sought, I shall try at this time to put forward some of the good points developed to date. Though it is bad form for one of its members to boast, someone should do it and I seem to be elected, having been caught between your genial president and a most persistent secretary.

The amendments to the National Defense Act, passed by Congress in 1920, gave us the necessary rank and authority for an organization. The Surgeon General, to make the corps a going concern, allotted to the veterinary service a percentage (small to be sure) of the enlisted personnel, provided for the Medical Department and with this personnel (commissioned and enlisted) a veterinary service is being developed in our army second to none. I might go further and say that the possibilities for the complete development of our service, are such that I believe we will have in time the best and most comprehensive army veterinary service in the world.

Army Veterinary Service When the War Began

In 1917 the duties prescribed by Army Regulations for the veterinarians consisted of two paragraphs as follows:

1. It shall be the duty of the veterinarian to visit at least daily all sick or injured animals at his station, and to recommend such treatment as he may deem proper. He will have access to the stables at all times. Upon request he will attend such authorized private horses of mounted officers as may need his service.

2. The veterinarian will instruct company horseshoers and company farriers in the proper care of the horse. In this he will give especial importance to the anatomy and pathology of the foot, showing the nature and uses of all its parts, illustrating the subject of dissections and specimens. He will also teach the principles and practice of horseshoeing. For the purpose indicated he will make such visits of instruction to companies of the regiment not at his station as may be deemed necessary by the regimental commander.

Shortly after our entrance into the world war, a veterinary advisory board was organized as a part of the newly created National Defense Council. This board consisted of Doctors Moore, Cotton, Klein, White, Marshall and Mohler. Col. Griffin, V. C., of our Army and Lt. Col. Aiken, R. A. V. C. were the military advisors. As a result of the work of this board, the veterinary profession was given an organization and set of regulations governing their activities that time proved to be even better than I dare say, the authors ever anticipated. Special Regulations No. 70 governing the veterinary service, were without doubt, one of the most complete set of regulations written during the war. By it our professional activities were definitely established.

After the reorganization of the army by Congress in 1920, the general staff adopted a new form of army regulations and included therein, not only all duties pertaining to each service but the methods of doing the things required.

The veterinary corps was one of the very first services to take advantage of this change and as a consequence we have today the most comprehensive set of veterinary regulations in existence.

I was in London making an inspection of the Royal Army Veterinary Service at the time these regulations were being published. The Veterinary General's office there had been re-

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ceiving copies through their military attache and one of the first topics of conversation was with reference to these new army veterinary regulations. The officers in the office were very frank in telling me that they thought these regulations were the best and most complete that they had ever seen.

Today then, the duties of the Army Veterinarian are outlined as follows:

Function of Army Veterinary Service
(Paragraphs 2 and 3, AR 40-2005)

2. **Animals**—a. As regards animals, the veterinary service is responsible for investigating the hygiene and the sanitary condition of the animals of the army and making recommendations with reference thereto; advising as to methods of animal management is so far as they concern animal health and efficiency; instructing military personnel in military sanitation and management and horseshoeing; the examination of forage when procured, in storage and at issue; the evacuation and care of sick and wounded animals; the physical examination of animals; the management and control of veterinary hospitals and all other veterinary units, and the control, training, instruction, and assignment to duty of the commissioned and enlisted personnel of the medical department assigned to veterinary service.

b. The objects of this phase of the veterinary service are to protect the health and preserve the physical efficiency of the animals of the army. These objects are to be attained by:

1. The application of the principles of veterinary sanitary science to maintain animals in a correct environment as regards their shelter, restraint, handling, feeds and feeding, grooming, work and exercise, shoeing, clothing and equipment with a view to eliminating so far as practicable the causes of physical inefficiency.

2. The initiation of suitable protective measures to prevent the introduction of communicable diseases, and the prompt detection and proper handling of such cases, including the adoption of the necessary suppressive measures to limit their duration or extension.

3. The reduction of animal losses and inefficiency by the prompt discovery of the sick and wounded, their separation from the well, their evacuation, their segregation in veterinary hospitals, and the application of curative measures.

4. The physical examination of animals prior to purchase and at other times with a view to ensuring the acquisition of only sound animals and the prompt and economical disposal of the unsound.

3. **Food Supplies**—a. As regards food supplies, the veterinary service is responsible for investigating the soundness of quality and sanitary condition of meats and meat food and dairy products prior to and at time of purchase, while in storage and at issue; the sanitary condition of establishments, storehouses, freezers, refrigerators, refrigerating space in cars and ships and other places in which such supplies are manufactured, handled, stored, shipped, or issued; the sanitary condition of dairies and milk herds supplying troops; and for making recommendations with reference thereto, and with the instruction of veterinary personnel in the performance of the foregoing duties. The necessary information is obtained through the operation of the veterinary inspection procedures prescribed in appropriate pamphlets, army regulations.

b. Such inspections of these supplies as to quantity and compliance with specifications are made at time of purchase or such other times as may be required by purchasing officers.

During all the years that the veterinary profession was devoting time and money to getting recognition for its members in the army there was not the scratch of a pen with reference to statistics to prove that the army veterinarian ever did a thing except draw his pay. The efforts during the years of campaigning were made simply on faith in the men of the profession who entered the military service being able to live up to or exceed the expectations of their supporters. I believe the present organization with its possibilities exceeds the fondest hopes of those men.

Ours is the only army veterinary service in the world with a dual function. First, those duties connected with the animals of the army. Second, those duties connected with the meat and meat food products furnished to troops.

Overcrowding hog houses or lots is conducive to the spread of parasitism and particularly lousiness and mange.

Although it is possible to maintain fertility by proper rotation of grains, grasses and legumes, i. e., by a system of cropping, it is more economical for the land owner to depend on live stock for the maintenance of soil fertility. The dairy cow is being used extensively in building up and replenishing depleted soils.

Developments in Veterinary Parasitology During the Past Fifteen Years

By Maurice C. Hall, Associate Editor

(Continued from July issue)

Treatments

The subject of anthelmintic treatments, both in human and veterinary medicine, has received much attention during the past 15 years, and shows much more gain in knowledge than at any previous period. In human medicine much of the progress in connection with worms in the digestive tract has followed from improved technic in fecal examination, making the evidence in regard to the efficacy of anthelmintic treatment more accurate. It has also been coordinated with the use of better anthelmintics, making test treatments more dependable. Finally, the vast amount of anthelmintic treatment in tropical countries for several years has checked the previous findings in regard to apparent cures and shown something of the probable error due to apparent, but not actual, removal of all worms present.

In veterinary medicine progress in anthelmintic medication has followed mostly from the use of the critical method of testing, i. e., the administration of anthelmintics to infested animals, the collection, determination and counting of all worms passed for several days, and a post-mortem examination with an accurate worm count for all worms not removed. In the period previous to the last 15 years critical testing had been undertaken by a few investigators, notably in Italy. Grassi and Calandruccio (1884; 1885) had made critical tests on male fern as a remedy for liver fluke in sheep, establishing its value for this purpose. Perroncito (1885; 1886), by critical tests, confirmed their work. For the next 20 years this method of testing was generally neglected, though Stiles and Pfender (1902) used a method which approached the critical method in testing thymol for the removal of whipworms from dogs.

In the last 15 years the method of critical test was used by Alessandrini (1908), Borini (1911), Railliet, Moussu and Henry (1911) and Marek (1916; 1917) in tests confirming the work of Grassi and Calandruccio and of Perroncito in regard to male fern for destroying liver flukes. The most extensive investigations by critical testing are those of Hall and his collaborators (Foster, Wigdor, Wilson, Smead, Wolf, Avery and Shillinger). What appear to have been similar tests, though the lack of adequate protocols in many cases leaves the matter in doubt in many instances, have been reported by Guberlet, Wright, Allen, Bru, de Blieck and Baudet, and Smillie and Pessoa.

Critical testing by the method outlined has been shown by Hall to be subject to certain errors of interpretation in connection with worms wandering through the tissues and returning as agamic adults or fourth stage larvae to the intestine, as in the case of the horse strongyles. It has also been shown by Hall and Shillinger to give misleading findings, unless properly interpreted, in the case of worms in the stomach, as many worms killed by anthelmintics in the stomach are likely to be digested. For worms in the stomach the method of treatment followed after a brief interval by post-mortem examination to ascertain the number of worms killed before the dead worms can be digested appears to be a valuable procedure. This method was extensively used in studies on stomach worms of sheep by Hutcheon in 1891, and has been used in similar studies by Stiles and by Veglia, and, apparently, by Lamson.

As a result of such studies, the anthelmintics, which were a chaotic group of "worm remedies" 15 years ago, are fast becoming a highly dependable group of drugs with very definite indications as to dosage, purgation, fasting, toxicity, contraindications, etc. We now have dependable treatments for bots, ascarids, strongyles and pinworms in the horse; for stomach worms, hookworms and tapeworms in sheep; for ascarids in swine; for ascarids, hookworms and tapeworms in dogs and foxes; and for the large roundworm and the cecum worm of poultry. There is still much to learn in regard to treatments and this is an excellent field for investigation.

The outstanding drugs in connection with the removal of parasites from the digestive tract are chenopodium for ascarids in man, dogs, foxes, cats and swine; carbon tetrachlorid, chenopodium and thymol for hookworms; carbon bisulphid for bots in horses; carbon bisulphid and carbon tetrachlorid for ascarids in horses; copper sulphate, copper sulphate and tobacco, copper sulphate and sodium arsenite, and nicotin sulphate for stomach worms in sheep; copper sulphate and tobacco for hookworms and tapeworms in sheep; tobacco for roundworms in poultry; chenopodium by rectal injection for

cecum worms in poultry; and arecolin hydrobromid, male fern, male fern and areca nut, and kamala for tapeworms in dogs.

Chenopodium was used by the American Indians before the Americas were known to Europe. It was introduced into Europe by Baumler in 1881. It was first seriously studied at some length by Bruening in 1906, and first given a detailed field test against hookworms by Schuffner and Verwoort in 1912. It appears to have been first used against hookworms in man in the United States by Levy in 1914. In veterinary medicine it was reported, apparently for the first time, by French in 1896 as a remedy for worms in dogs. Hall and Foster reported the first critical tests of the drug in 1918 and several further studies were published by Hall and Wigdor. The literature in human medicine can not be reviewed here, but the drug has been extensively tested by the medical staff of the International Health Board of the Rockefeller Foundation and by Caius and Mhaskar in India.

Carbon tetrachlorid was introduced into veterinary medicine by Hall in 1921 on the basis of critical tests on dogs and recommended for test in human medicine against hookworms. It was first reported for human cases the following year in garbled telegraphic dispatches covering Lambert's work in Fiji and in a paper by Leach on work in Ceylon. In the course of two and a half years since the drug was first proposed as an anthelmintic, there have been almost 100 papers published on its use as an anthelmintic. It appears to be the best drug for the removal of hookworms from the standpoints of efficacy, safety, ease of administration and cheapness and is the one new anthelmintic for removing worms from the digestive tract which has been proposed and extensively used during the last 15 years. In this connection the work of Macht and Finesilver, showing that Epsom salts administered at the same time as other drugs diminishes or inhibits the absorption of the other drugs, deserves mention, as the simultaneous administration of Epsom salts and carbon tetrachlorid promises to add greatly to the safety of carbon tetrachlorid. Lambert has published the results of the treatment of 7,000 persons by this method and finds it a distinct improvement over the method of giving the anthelmintic first and following the treatment by purgation several hours later. Hall and Shillinger have shown by critical test on dogs that this does not diminish the efficacy of the carbon tetrachlorid. Allen and others have shown the efficacy of carbon tetrachlorid for removing hookworms from foxes. Hall and subsequently de Blieck and Baudet have shown its value in removing ascarids from horses and some value against bots, strongyles and pinworms.

Carbon bisulphid was proposed for the removal of bots by Perroncito and Bosso in 1894 and shown effective on critical tests in recent years by Hall, Smead and Wolf, and by Hall and Avery.

Copper sulphate was proposed by Hutcheon for stomach worms of sheep and critically tested by Hall and Foster; copper sulphate and tobacco was proposed by Guberlet; copper sulphate and sodium arsenite was proposed by Veglia; and nicotin sulphate was proposed by Lamson.

The tobacco treatment for worms in poultry was proposed by Herms and Beach in 1916. It was critically tested by Hall and Foster in the form first proposed. The treatment has been modified subsequently by Beach and Freeborn.

Arecolin hydrobromid was first used to remove tapeworms in human medicine. It was introduced into veterinary medicine by Lentz and critically tested by Hall and Shillinger.

For Worms Not in the Digestive Tract

Much progress has been made in the last 15 years in treating worm infestations in those cases where the worms are not in the digestive tract. In veterinary medicine the male fern treatment for liver flukes, first proposed in 1884 and allowed to fall into the category of forgotten and unused information, was revived and has come into general use. Little else of the sort has originated or developed in veterinary medicine and we owe most of our present knowledge of anthelmintics for worms outside of the digestive tract to workers in the field of human medicine. Their findings can be reviewed here only very briefly.

The successful treatment of schistosomiasis, infestation with blood flukes, by means of emetin or tartar emetic is an outstanding achievement of the past 15 years. The results of the treatment do not sustain the pessimistic view of Looss and others 15 years ago that schistosomiasis was an irremediable condition, as marked benefits follow the destruction of the flukes. Tsykalas has recently stated that Velassopoulos of Alexandria first reported a cure by means of emetin in 1913, and that he, Tsykalas, reported a similar case before the Greek Scientific Society of Alexandria the following year. This work was followed by the reports of Hutcheon (1914), Mayer (1914),

Bouilliez (1915), Post (1915), Diamantis (1917; 1918), Erian (1918), Balfour (1920), Day 1921), and others. McDonagh (1915) reported favorably on antimony in a book on venereal disease, but this note was naturally overlooked by workers in tropical medicine. Christopherson (1918) first brought tartar emetic definitely to the attention of the medical profession as a cure for schistosomiasis, and his work has been confirmed by McDonagh (1918), Wiley (1918), Low (1920) and others. Cawston (1921) has reported that this drug destroys Schistosoma bovis. Wilson (1922) has reported favorably on the rectal injection of the drug.

The destruction of the Guinea worm, Dracunculus medinensis, appears to be comparatively easy. Macfie (1920) reported its destruction by intravenous injections of tartar emetic, and Duff (1923) has had the same results with tartar emetic by the mouth. LeDentu (1923) had good results in 24 of 30 cases, with failure in 6 cases. Jeanselme (1919), Montpellier and Ardoin (1919), and Grey (1920) report good results with novarsenobenzol. Richards (1922) reports that a high sugar diet, a pound or more of sugar a day, results in the rapid expulsion of the worms. Tournier (1922) had promising results with tartar emetic by the mouth, but better results with sulphureted antimony by the mouth.

The case as regards Filaria bancrofti remains to be made. Noc (1923) has recently summarized our knowledge of this subject and reported that aminophenol had a destructive action on the microfilariae in the blood but did not appear to affect the adults, as microfilariae reappeared in the blood in time.

Aldigé in French West Africa reports that in horses infested with microfilariae, tartar emetic intravenously produced marked local and general benefit and resulted in the disappearance of the microfilariaie from the blood.

Poisonous Plants

By L. H. Pammel

ERGOT IN RYE

Mr. W. W. Fassett of Panora, Iowa, writes as follows:

"Will you kindly inform me what the symptoms of ergot poisoning are? I have several cows that have run on a rye pasture that have developed an inflammation of the vagina which the veterinarian believes is caused by ergot poisoning. Is there any serious danger from stock running on rye pasture developing this disease and if so, what animals are the most susceptible to it? I have cows, steers, hogs, horses and chickens all on this pasture without any other trouble except the cases mentioned above. These two cases have both developed just today. One cow was off feed a day or so before this developed. She was washed out with antiseptics and given a drench this morning and tonight she is eating and the swelling has gone down considerably. The second cow developed a case tonight, similar in all respects to the first, although I am not sure whether she was off feed or not as I did not milk her myself and she has been on pasture."

There is no danger from rye poisoning if the plant is not in the blooming stage, but when it comes into bloom or about to ripen there is a great danger of poisoning. In my "Manual of Poisonous Plants" the symptoms are given as follows:

"Symptoms referable to the digestive tract, such as nausea, vomiting, colic, diarrhea or constipation appear in both forms. Pregnant animals very frequently abort.

"In the spasmodic type of the disease, symptoms due to over-stimulation of the central nervous system, appear. These are tonic contractions of the flexor tendons of the limbs, anesthesia of the extremities, muscular trembling, general tetanic spasm, convulsions and delirium. Death usually occurs from secondary causes.

"Gangrenous ergotism is attributed to prolonged constriction of the arterioles, and more directly perhaps to degenerative changes in the vessel walls, and the consequent formation of hyaline thrombi.

"It is characterized by coldness and anesthesia of the extremities, followed ultimately by dry gangrene of these parts. The effects of this dry gangrene are often very serious and amount to sloughing of the feet, tips of the ears, tip of the tail, shedding of the hair, teeth, etc. Death takes place from exhaustion."

Dr. McNeil has given the symptoms as follows:

"Ergot stimulates the nerve centers that cause the contraction of the small blood vessels, supplying the different parts of the body and

cause one of the two forms of ergotism, namely, a nervous form, and a gangrenous form.

"Nervous ergotism: In this form the contraction of the blood vessels of the brain produces dullness and depression. The animal also suffers from gastrointestinal catarrh, refuses food, and gradually passes into a condition of general wasting. The nervous form, however, may assume an entirely different aspect and the animal dies suddenly in delirium or spasms, or gradually from paralysis.

"Gangrenous ergotism: In this common form the checking of the blood, resulting from the contraction of the small blood vessels, causes a loss of a part or of all the limb below the knee or hock, and tail, or the ears. This form of the disease may manifest itself by the formation of ulcers at the top of the hoof or between the toes, and a toe may be lost or the entire hoof shed. The affected part dries, a small furrow or line of separation appears, completely surrounding the limb, dividing the living from the dead mummified tissue."

COFFEE BEAN POISONOUS

Mr. William Dietrich of Charles City, Iowa, sends the following letter and a specimen of bean. The bean proves to be the coffee bean (Gymnocladus dioica).

"Enclosed is sample of bean seed or something of similar nature which evidence seems to indicate might be poison.

"A certain man's cows in this part of the state were found to be sick, going into convulsions and having a stiffness. A veterinarian was called and the case was diagnosed as being caused by a poison of some sort. The cows during their sick spells threw up articles of the nature of the one enclosed, and these same seeds, or whatever they may be, were also found among the hay in the manger.

"The man who owns these cattle had had some disagreement with neighbors and was wondering if someone was trying to poison his cattle."

Coffee bean is widely distributed from western New York to Pennsylvania, through Iowa, eastern Nebraska and Arkansas. It has long been recognized as poisonous. I presume the poisonous qualities must be attributed to the pulp in the pod rather than the seed. I do not know that an analysis has been made of the seed, it may contain some poison. The seed coat is very hard and not digestible. "The alkaloid cytisin ($C_{11}H_{14}N_2$), a crystalline, rather bitter, and caustic substance which causes dilation of the pupil, is reported to have been found, according to Chestnut, in the leaves and soft pulp of the fruit of the coffee bean. The pulp has long been used, when mixed with milk, to poison flies."

IS THE PROSTRATE VERVAIN POISONOUS

Mr. William Lundstrum of Leland, Iowa, writes as follows concerning a specimen he sent me:

"Enclosed please find a flower of a plant or weed. What do you know about this plant? Is it poisonous to stock? I saw another that looked like a thistle, a kind of tree-shaped, about one foot tall, with yellow flowers, but am unable to get a sample now. It had needles on the stem."

The plant sent in is prostrate vervain (Verbena bracteosa). The plant has somewhat jagged leaves and small, bluish flowers with somewhat elongated bracts with the flowers.

I have never heard of a case of poisoning from this plant. It is closely related to the hoary vervain (Verbena stricta) which is a very common weedy plant of the north. This erect plant produces spikes of bluish flowers and has hairy leaves. It is especially common in dry pastures. Cattle carefully avoid it because of its bitter and somewhat disagreeable taste. I suppose there is something distasteful in the plant, otherwise it would be eaten. There are few plants in the verbena family which are recorded as poisonous. Have any of the readers of Veterinary Medicine had any experience with these plants?

BUNCH FLOWER POISONOUS

Mr. C. G. Koebke of Bloomfield, Iowa, sends in a plant of the bunch flower (Melanthium virginicum) found in low prairie in eastern Iowa and eastward. This plant has ample clusters of small white flowers and veratrum like leaves. I am glad to get this note from Mr. Koebke so that I may call attention to it. I have this to say in my "Manual of Poisonous Plants": "Several correspondents in Iowa have attributed poisoning of horses to this plant. Several related plants of the Melanthaceae like Zygadenus and Veratrum are known to be poisonous. * * * Dr. Blanche, a veterinarian in Belle Plaine, this state, found that horses fed with hay containing this plant 'Became ill and acted as if they were crazy.' The symptoms were much like those of aconite poisoning. The bunch flowers have long been used to poison flies, and Hyams, of North Carolina, says that they are poisonous to crows."

Hemophilia In Milk Cows

By S. L. Stewart, Olathe, Kansas

In writing about hemophilia in cows, I find it rather difficult as so little literature upon the subject can be found. All I have been able to find is a short, condensed, generalized description that means but little to anyone in search of data on the subject. Therefore I feel completely lost when attempt is made to describe the condition.

Hemophilia is said to be either an inherited or acquired disorder of the vascular system characterized by an abnormal liability to severe and sometimes uncontrollable hemorrhage.

The symptoms are discovered only by accident, a slight wound, or in the case to be described, blood found in the milk, and uterine hemorrhages at time of parturition. However, in some cases an abnormal mental attitude may be expected. Some may be excitable and nervous or melancholic, while others may show a somewhat stiffened gait (pseudo-rheumatic). It is said that in man arthritic symptoms are often a precursor of approaching hemorrhage of the joint capsule. Hemophilia does not always manifest itself by external hemorrhage and for that reason many hemophilic cases may not be diagnosed.

The pathology of hemophilia is of an interesting nature and only a few have advanced their knowledge of this condition. However, the prevailing view is that hemophilia is mainly due to a morbid condition of the vascular walls, and affecting especially the middle or muscular layer. The changes are such as to seriously compromise the anatomical and physiological functions, due to direct chemical changes between the physiological products of certain organisms and the protoplasm of the histological elements. The vasomotor nerve system doubtless plays a large part in the process, and no doubt the suprarenal internal secretion controls to a certain extent the vasomotor system.

It is possible that abnormal alkalinity of the blood, by impairing the capacity of the blood for coagulation, may assist in the production of hemorrhages.

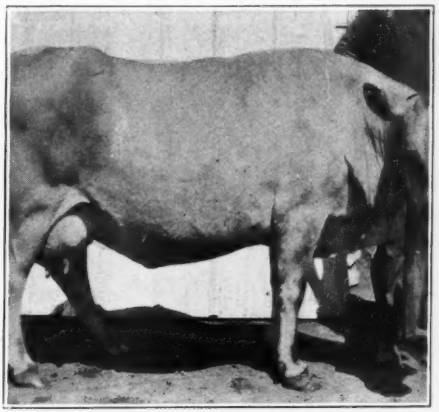
The essence of hemophilia is believed to be in a heightened activity of the blood-making organs, or depraved activity of the nerve centers, some part of the brain, or some gland of internal secretion (thyroid or suprarenal) which fails to function sufficiently.

The prognosis is always guarded. This does not necessarily mean that the patient will die from hemophilia, as death from this cause is somewhat unusual, but the question arises in the cases reported, will the cow get well and if apparently well, will hemophilia recur and the cow again produce red milk or show other symptoms? The only answer that can be given is that the original cause may not have been removed, and if not, the condition may return. However, in the four cases of udder hemophilia diagnosed by the author all have recovered, at least for the time being. In the past I have sent to slaughter several good Jersey and Holstein cows that gave bloody milk and that I now believe to have been hemophiliacs and probably amenable to treatment. Hemorrhage in the udder from contusions must not be confused with hemophilic hemorrhages, as a bruised udder has special symptoms, pain, heat, swelling, sensitiveness to touch, and the blood usually clots, while in hemophilia the blood does not clot and when present in the milk the entire milk is colored more or less red and the blood has no inclination to clot.

The treatment of hemophilia consists in the avoidance of exciting factors; scratches, cuts, bruises and so forth. In human practice, preparations of hydrastics, iron and especially strychnin, have been advocated, with preference for the administration of strychnin, in all cases of hemophilia. However, within the last few years, transfusion of entire blood has been brought into use, of which but a small quantity will sometimes stop an otherwise uncontrollable hemorrhage. Thyroidin is used also with fair results to accomplish a cure, only in a different way. Many other remedies have been advocated, but knowing the intimate relation existing between the adrenals and the central nervous system, I have concluded that hypodermic injections of adrenalin chlorid should give desirable results, with the addition of foreign serum. This theory has been followed in the treatment of the four cases of hemophilia in cows which was indicated by hemorrhage in the udder causing bloody milk with satisfactory results in every case so far.

I shall report only one hemophilia case which was one of outstanding character. A high-grade Jersey cow, ten years old, in fair flesh and a heavy butterfat producer, ten months after parturition, began gradually to produce bloody milk from the right fore quarter. After a thorough examination of the cow, I recommended that milking be discontinued, except only sufficient to dry her, advising that the cow would be all right when she freshened again. In about thirty days the cow began to show signs of coming fresh and again I was called upon for another examination to determine if the udder was all right. To my surprise and perplexity I found bloody milk in all four quarters, the first quarter involved producing the bloodiest milk. Samples of milk were obtained for laboratory analysis, with the result that a diagnosis of hemophilia was made. The cow being a hemophiliac, was treated with foreign serum subcutaneously in doses of 20-30-35 cc. and adrenalin chlorid solution, 5 cc. at each dose, every fifth day. Two days after the second dose had been given, the cow freshened, and because of absence of labor, it became necessary to remove the fetus. Upon examination it was found that the first stage of labor was complete, but because of an inert uterus the second stage of labor could not be completed. The fetus was easy to deliver, but regardless of this fact, following its removal, a severe uterine hemorrhage prevailed. The obstetrician began to think an undertaker would soon be needed. However, after the administration of a large dose of adrenalin chlorid solution, the hemorrhage ceased within a few minutes. The adrenalin no doubt assisted in checking the hemorrhage, but the hemorrhage may have ceased when capillary pressure became sufficiently lowered. When the third dose of serum and adrenalin was administered, only a slight coloring with blood could be seen in the milk. Five days later the milk was normal as far as a microscopic examination revealed, and remained normal. The cow was sold some three weeks later and her identity lost.

Another interesting feature is worthy of mention in this case, which can be seen in the picture, and that is a subnormal development and function of the udder and especially the right fore quarter. I doubt if a true atrophy exists; however, the subcutaneous abdominal veins appeared to be as large and congested as if the udder had properly flushed for calving. The picture was taken two days before parturition. The cow naturally possessed a large udder, but at this freshening the udder was unusually small and flabby.



I will say that I am not satisfied with subcutaneous serum injections, as frequently severe swelling takes place at the point of injection and persists for several days, which is decidedly undesirable. I am, at this writing, treating another case and introducing the serum intraperitoneally, but can not as yet give a report of the results.

Bad results alone will not justify an inference of improper treatment. The skill and care of the most competent and painstaking surgeon often fails to cure or relieve. The inherent recuperative or healing powers of patients differ greatly. Even in the same person, such powers may vary from time to time. Therefore, when the question is to be determined whether a physician or surgeon has negligently or unskilfully treated or operated on a patient, the standard to be given the jury is the usual and customary practice of the ordinarily skilled and careful practitioner in the community. When the physician has come up to that standard, the law holds him free from damage claims, even though it appears that errors of judgment in diagnosis or treatment have occurred.—Journal A. M. A., 6-5-24.

It is sometimes difficult to distinguish between deficiency and vicious habits. Do hogs kill and eat chickens as a result of deficiency in the supplied food or because of habit? Some few swine breeders have reported that the feeding of a ration containing vitamins and minerals will apparently prevent chicken eating. If chicken eating is primarily a deficiency disorder affected hogs should be cured by providing a proper ration. It is generally conceded that vitamins and minerals are of very great value in correcting certain disorders, but common sense implies that such products are not indicated as a cure in all diseases and disorders; neither do we believe that either vitamins or minerals separately or combined can be recommended as a preventative or cure of vicious habits.

The Digestive Organs of the Fowl

By B. F. Kaupp, Poultry Investigator and Pathologist, North Carolina State College, Raleigh, N. C. Author Poultry Diseases, Anatomy of the Domestic Fowl, Essentials of Poultry Raising, Poultry Culture Sanitation and Hygiene and Animal Parasites and Parasitic Diseases.

More interest is being shown in the diseases of poultry as the years go on because of the increased value of poultry due to better breeding and the replacement of the mongrel farm chicken by the pure bred fowl. It is being realized that before the producer can grade his eggs and table fowls it is necessary to first standardize his flocks which means the keeping of all one breed and the proper selection for stamina as well as other things. Eggs are beginning to sell, even in the "sticks," on a grade basis and soon all sales will be on a graded basis as in the city. And why should it not be that way? Everything else sells according to grade which is another way of saying according to value. These changed conditions make fowls valuable and essential that more attention be paid to the control of poultry diseases. With the coming of closer population there comes with it disease problems.

How to Autopsy a Bird

Lay the dead bird on a table, or top of a barrel, so as to be the right height, and with its head from you. With a sharp scalpel make an incision through the median line of the abdominal skin. Grasp the sides with the hands, as you would skin a rabbit, and tear the skin down the sides so as to lay bare the whole abdominal wall. Next make an incision along the side of the abdomen on either side, grasp the end of the sternum with the right hand and force forward till it breaks at its anterior attachment and remove. The organs are now laid bare. You will note the heart with its anchored pericardium extending from the thoracic cavity; the apex extends slightly between the lobes of the liver. The lungs lie in the roof of the thoracic cavity occupying about one-seventh of the cavity and pushing out between the ribs. The liver is noted as a large dark organ, the largest gland in the body. This is shown at letter "c" of the illustration. Behind the liver will be seen the gizzard and around this the intestines.

Various Parts of the Digestive Tract

Removing the intestines and starting at the beak, as shown in the accompanying picture, we observe at "a," the tongue which is shaped like an Indian arrow the posterior edge being lined with small filiform papillae. The tongue in the fowl is not very flexible and the part it plays as a prehensile organ is that of aiding in forcing the food into the pharynx. The mucous membrane of the pharynx is thrown into folds and communicates with the esophagus. The esophagus in the fowl is divided into two parts, the first portion and the second portion, they being separated by the crop. The function of the esophagus is the passage of the food. The function of the crop is that of storage of the feed during the hours of feeding. The feed thus stored is doled out as it is needed by the stomach. Grain takes longer to digest than ground feeds. The feed passes from the crop through the second part of the esophagus to the proventriculus. The proventriculus is a fusiform shaped structure. Its walls are lined with tubular glands and deeper in the structure there are alveolar glands. Acid and pepsin are secreted here and the feed rests here a short time where it is bathed in the acid secretion and pepsin. The feed now passes into the gizzard

where it is ground to fineness and then passes into the first portion of the small intestine, or duodenal loop. There are glands in the saccular portion of the gizzard which secrete pepsin. The duodenum is given off from the front part of the gizzard and about one-half inch from the entry of the proventriculus. In the duodenal loop there is located the pancreas. The pancreas secretes digestive fluid, as in other animals, which aids in digestion. From the duodenal loop the food continues its way through the free portion of the small intestine to the large intestine or rectum. The rectum or large gut is about 4 to 5 inches long. When the intestinal content is poured into the large intestine, by reversed peristalsis, it is carried into the ceca of which there are two. The liver pours its bile into the intestine about 14 inches from the origin of the small intestine. The mucous membrane lining the small and large intestine, as well as the ceca, are provided with tubular glands which secrete the succus entericus.

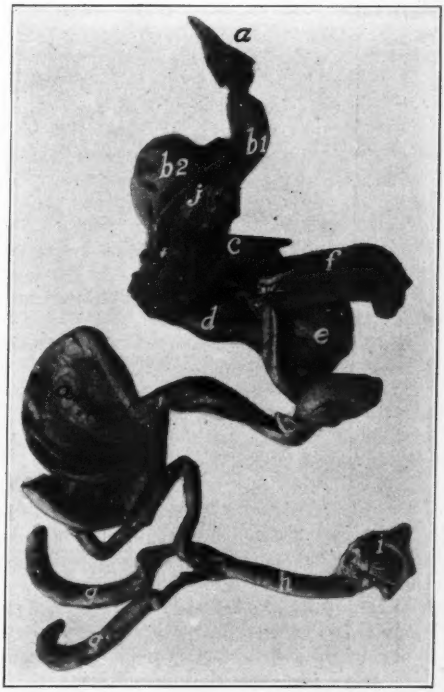
Length of Time for Food to Pass the Digestive Tract

The intestines in the fowl are about 61 inches long. All the processes of the fowl are rapid and its life span is rather short so that we would expect digestion likewise to be rapid. Extensive tests were run to determine this point with the following results. The birds were in the digestion coops and were fed in the morning on empty crops and with ground feed. Lampblack was used as an indicator. The greatest rapidity of digestion was shown in the laying hen and the growing fowl. It required three hours and forty-six minutes for the former and three hours and fifty-two minutes for the latter for feed to pass the entire digestive tract. Next in activity comes the hen not in laying condition, averaging eight hours, and then the broody hen requiring an average of eleven hours and forty-four minutes. It is noted that broody hens behave the same in the experimental coops as on the nest, that is, the evacuations were fewer and the quantity evacuated each time increased over that of a normal hen.

Function of Grit in the Gizzard of the Fowl

Thirty-six hens were used in this experiment. The hens were all Barred Plymouth Rocks and of two or three years of age. The hens were kept in coops sixteen inches square with one inch chicken netting bottoms. At the time these birds were placed in the coops two were killed to determine the amount of grit the gizzard of each contained. At the end of 14 days two more were killed and finally the last two were killed at the end of 365 days. The result was that at the end of 365 days off of grit both birds possessed sufficient grit in their gizzards to properly grind their feed. Experiments show that a bird is constantly taking more grit into the body than she needs. The excess grit is constantly being thrown off from the body through the droppings. It was observed that at the end of about 12 days the excess grit has been given off and that which passes after that time is very small.

From studies in the poultry pathological laboratory as well as the above studies, we find that the grinding of feed is one of action like a ball mill rather than one of a cutting process.



The Digestive Tract of The Fowl. a, the tongue; b1, the first portion of the esophagus; b2, the crop; c, the liver; d, the proventriculus, above which is the spleen; e, the gizzard; f, the duodenal loop between which is noted the pancreas; g, the ceca; h, the large intestine or rectum (straight gut); i, the cloaca; j, the trachea; a1, the mesentery of the floating portion of the small intestine.

European Foul Brood of Bees

By T. A. Kragness, M. D. C., Chicago, Ill.

European foul brood has caused a great loss to the bee industry as has the better known and wholly different ailment—American foul brood.

European foul brood attacks the larva in the early stage of its development. American foul brood attacks the larva after feeding has ceased. The European ailment affects the larva while still curled up in the cell; the American ailment, after the larva has straightened out and has its head outside the cell.

The earliest symptoms of European foul brood is a slightly yellowish discoloration and an uneasy movement of the larva in the cell. This occurs, as mentioned above, during the curled-up stage when the larva is lying at the bottom of the cell and only partly filling it, or in other words, within the first three days after the egg hatches.

The larvae invaded by European foul brood twist themselves all about the cell, assuming every possible position, head and tail to the front, head and tail to the rear, tail to the front, etc. These movements are characteristic of the European disease.

Another early and dependable symptom of European foul brood is a slight transparency of the larvae, enabling one to see the spiracles. The bee larva breathes through tubes or spiracles opening from the trachea. These spiracles are arranged along both sides of the larva. Connecting the spiracles longitudinally and also running around the larva are tubules. In healthy larvae, these spiracles and even the trachea are not observable, but when European foul brood attacks them, the bodies of the larvae become sufficiently transparent to enable one to see lines running off from the trachea and smaller lines encircling the insect. As decay proceeds, the larvae take on a melted appearance. The whole surface next sinks in and one is no longer able to see the trachea or spiracles, and the larva becomes smaller. Following this the body shrinks upon the respiratory framework and it again becomes visible. Finally, the larva becomes a mere scale, brown, yellow or gray and occasionally black.

European foul brood is caused by the Bacillus pluton. When the infection is purely one of B. pluton, there is little or no variation in the symptoms. When there is a contamination by Bacillus alvei, which is nonpathogenic for bees but causes putrefaction, variations in the symptoms occur, particularly in the color of the scale. There are several other bacteria frequently present with the B. pluton in contradistinction to American foul brood which is caused by a single organism, which always occurs in pure culture in the scale.

Characteristic Differences Between American and European Foul Brood

Amercian foul brood causes the larva to become very adhesive so that it adheres to the cell, while in European foul brood, the larva does not adhere at any stage of the infection or decay. The larva can be removed very easily at any time. This point is a very important factor as pertaining to the treatment of the condition.

European foul brood sometimes causes the larva to show a slight ropiness, which does not occur when the Bacillus pluton alone is present, making diagnosis very confusing. If one inserts a toothpick into a larva affected with European foul brood at certain stages, it may adhere or pull out resembling a rubber band that has lost its elasticity, pulling out a little and then breaking. Occasionally we find a larva which will pull out but slightly.

If Bacillus pluton alone is present, there is practically no odor with the European type of infection, but when contaminated with Bacillus alvei or other putrefactive bacteria, there is an odor at times like that of yeast fermentation.

European foul brood attacks not only the working larvae but also the drone and queen larvae. This is of great importance, as when we find drone and queen larvae affected, there is every reason to suspect that the disease is European foul brood. In cases of the presence of this infection, when bees attempt to supersede their queens as a general rule they fail; the queen larva becomes infected and the colony becomes hopelessly queenless.

Another peculiarity that is a prevalent characteristic is that American foul brood spreads rather slowly, starting with a small amount of infection the first year and becoming greater the next year, while with the European type it spreads rapidly.

The spores of American foul brood possess great resistance. On the other hand, Bacillus pluton does not form spores and is readily killed by heat, disinfection, or by bees in cleaning out dead larvae. Taking these two points into consideration, one arrives at a basis

for treatment. There are no adhesions to the cell in European foul brood and the bacilli of this type are easily killed; therefore, treatment is modified.

Peculiarities Leading to Method of Treatment

European foul brood is a disease of weak colonies. Generally speaking, it is a disease of failing colonies. It is prevalent in the spring and early summer, disappearing later in the summer unless the colonies are so weakened that they cannot remove the dead larvae. Thus the affection disappears of its own accord. The disappearance is usually at the beginning of the honey flow. The earliest brood of the year escape with very little loss. Some bees resist the disease more readily than others. The Italians resist the infection better than other breeds.

European foul brood is an infectious disease caused by a specific bacillus and has never been found elsewhere than in a beehive. The causative organism is such a highly specialized bacillus that it will not grow elsewhere. It will not grow in dead, but only in living, bee larvae. It does not cause larvae to adhere to the cell, does not form spores and is easily killed. The bees can carry out the larvae affected and thus get rid of the disease, unless reinfection takes place.

In American foul brood, the spores are found in the honey gathered during the period of infection. This is not the case in the European type. We do not know definitely how this disease spreads from colony to colony. There is evidence that the young nurse bees are responsible for the transmission by mingling together in finding their entrance. It is not necessary to disinfect hives or combs. The important thing is to prevent the disease instead of curing it; that is, to give the bees a chance.

First, is to use resistant stock; the Italians are regarded the best as to their resistance to European foul brood.

Second, the strength of the colony is equally as important. In a very strong colony, the disease will not enter, because it cannot remain there. At times strong colonies will contract the disease to the extent of having a few infected larvae, but strong colonies do good house cleaning and will take out the diseased larvae, so the infection will not spread.

To eradicate European foul brood means good bee keeping.

Treatment

This is done by placing the bees in such a condition that they can clean out the disease. Dr. E. F. Phillips has summed up the whole matter of preventive measures: "The practices of good bee keeping are those which result in the eradication of European foul brood."

Mr. E. W. Alexander's treatment consists in removal of the queen; that is, to leave the colony queenless for a period of 27 days, the object being to give the bees an opportunity to clean out all infected material.

Dr. C. C. Miller has left colonies queenless about ten days, and during this period the bees cleaned out the infection. The difference between Mr. Alexander's and Dr. Miller's colonies were that the former had smaller hives and much weaker colonies. It took his colonies 27 days to clean out the infected material, while Dr. Miller's colonies were of a more resistant stock and stronger. If the colonies are weak, it is desirable to unite two or more of them. By uniting two or more in this way, frequently there is a change of morale and quick cleaning up of infected larvae.

Another Method of Treatment

Suppose we have ten diseased colonies to be treated. We divide these up according to their relative strength. Five may be stronger and five weaker. So we shake the five stronger colonies and place them on drawn combs containing little honey. They are shaken by taking away their combs containing diseased larvae. This infected material containing some larvae is placed on the weaker colonies to build them up to where they in turn may be shaken, the object being to house-clean the stronger colonies at once, introducing an Italian queen at the time the shaking takes place.

The others will build up and in time we can perhaps shake three or four of these, placing the remaining brood on the other one, when it will build up and can then be shaken if need be. This treatment is simply to assist the bees to clean house; that is, to aid them in pursuing a rapid building up process.

On the other hand, if the colonies are headed by resistant queens, ripe queen cells from the best queens of non-infected hives may be introduced into colonies at the time the old queens are killed or a few days later, depending on the severity of the disease. Careful examination of the combs should be made and all queen cells removed before introducing the ripe cells. Negligence at this time may result in a hopelessly queenless colony due to the destruction by the bees of the cell introduced and injury to the cells reared by the colony due to the disease.

NEW TREATMENT FOR ACTINOMYCOSIS

The following is an excerpt of Dr. H. J. McCartney's address delivered at the Missouri State Veterinary Medical Association, Excelsior Springs, Mo., June 25th, 1924:

The control and treatment of bovine actinomycosis has been discussed at previous meetings but with your permission I will briefly outline my method of treating certain cases of this disease. It may be stated that actinomycosis is rather prevalent in southern Missouri. In some instances a large percentage of a herd of cattle may be affected. The disease is apparently becoming more prevalent and it seemed possible that the discharge of actinomycotic pus was a source of more intensely infecting feed lots and pastures and it was my opinion if some treatment could be applied that would diminish the discharge of pus the disease could be controlled.

Keeping in mind the necessity of curtailing or entirely preventing the discharge of pus from antinomycotic lesions, it was decided to experiment with formalin injections into encapsulated actinomycotic lesions. One or two cases were selected in which the lesion was definitely encapsulated and not involving bone tissue. By means of a 5 mil syringe and a long needle, 5 mils of formalin (40% formaldehyd) was injected into the lesion, using care not to permit the escape of any of the formalin into the surrounding tissue. These cases were observed rather frequently and it was noted on the second day that there was some reaction manifested by swelling. The swelling soon subsided and the actinomycotic lesion gradually became smaller and more dense. On the fifteenth day after the injection the lesion was dense and appeared to be relatively unattached to the surrounding tissues as it would move about under the skin when palpated and it was removed. The lesion was removed by making an incision through the skin and breaking down the remaining attachments of it to the surrounding tissue. There was no hemorrhage excepting from the incision in the skin. The capsule of the lesion was leathery and dense, and the contents were dark and semi-solid. There was no pus and therefore no danger of infection of soil or forage. The skin incision healed promptly and there has been no recurrence of the disease.

This method of treatment has been used on many cases and has always been successful. The advantages of this procedure over the old methods are, first, it is not necessary to use casting harness, as the animals are easily restrained for both the injection of the formalin and removal of the lesion; in fact, I have not cast an animal to inject or remove the lesion. Second, this method is apparently universally successful. Third, it destroys the infection in the pus within the capsule and thus removes the danger of reinfection. It is necessary to make two visits, one to inject the formalin and another 15 to 20 days later to remove the lesion; however, the owners thus far, in my experience, have been well satisfied and there is increasing demand for this method of treating actinomycotic cases.

It should be remembered that the procedure outlined above is applicable only in those cases in which the lesion is definitely encapsulated and has not broken and is not discharging pus. In making the injection, care must be exercised not to permit even one drop of the formalin to escape into the surrounding tissues, and the injection should, therefore, be made slowly and if the lesion is very large the formalin should be injected into different portions. The escape of formalin into the surrounding tissue can be prevented by holding the needle in the lesion for a moment after the injection has been made.

IMMUNIZING AGAINST HEMORRHAGIC SEPTICEMIA

Ever since the recognition of the infectious nature of hemorrhagic septicemia in the various species of animals, efforts have been directed towards the development of an effective immunizing method. These investigations resulted in the production of various preparations such as bacterins, vaccines, bacterial extracts and immune sera, all of which have found extensive application for the control of the disease. The results following their administration were not uniformly effective, although conclusive evidence is available to indicate the favorable action of the vaccination in checking outbreaks.

The variance in the virulence of the various strains of the hemorrhagic septicemia organisms no doubt somewhat influenced the results from the vaccination and may also explain why some investigators could not confirm the good results obtained by others in their experimental work.

Recently William S. Gochenour, of the Pathological Division of the United States Bureau of Animal Industry, isolated from the heart's blood of several buffaloes, the hemorrhagic septicemia organism which proved virulent for all species of domestic animals regardless of

their age or condition. He further established that the subcutaneous injection of cultures of this organism when inoculated into animals produces aside from the characteristic lesion of hemorrhagic septicemia very extensive subcutaneous edemas. The invariable appearance of these edemas containing a large quantity of fluid suggested the presence of aggressins. As a matter of fact the germ-free filtrates of these edematous fluids proved to contain such aggressins which upon injection into susceptible animals conferred upon them a solid immunity.

In a most interesting publication on "hemorrhagic septicemia studies," Dr. Gochenour has proved the consistent pathogenicity of this particular strain isolated from buffaloes for all species of animals and also the remarkable protection which the aggressin obtained from this edematous fluid possesses.

Comparative studies of bacterins, vaccines and aggressin have definitely established the protective qualities of the aggressin over the other products. Dr. Gochenour has further shown that the production of the aggressin is practical and may be made available for the control of outbreaks of hemorrhagic septicemia in the various species of animals.

In hemorrhagic septicemia aggressin the veterinarians are indeed fortunate in having a product available with which they confidently may expect to check outbreaks of this frequently destructive and dreaded disease.

A. Eichhorn

Pearl River, N. Y.

CASTOR OIL PREFERABLE IN WORMING PIGS

What amount of Epsom salts should be given a group of pigs, say twenty-five, after administering oil of chenopodium?—A. H.

Reply: The dose of Epsom salts for a group of pigs after the administration of oil of chenopodium, is, none. Give castor oil with the chenopodium. It is far safer and much easier.

CASTRATION OF OLD RAMS

It has been observed that castration of old rams by the ordinary technic is frequently followed by the death of the patient. This is believed to be due to the too-rapid closing of the wound. The ordinary docking pincers for docking lambs may be used. They are used hot and the entire neck of the scrotum is seared off. The inguinal region should be protected during the operation by two notched boards. We believe this method of operating was first advocated by Joe Wing, a practical sheep man. We have used it in not a few instances, and have yet to experience the first bad results.

B. L. Warwick, D. V. M.

University of Wisconsin

DIAGNOSIS OF DEATH BY LIGHTNING

I have read with much interest the article on lightning stroke in the August issue. I have held postmortem examinations on several animals dying from lightning stroke and have my first one to examine yet in which I did not find the bones parted in the frontal sinus over the brain and down toward the nose, in some cases the gap being one-fourth of an inch. Lightning is the only thing I know among ordinary causes of death that will produce separation of these bones. If others will observe and report on this same condition, it will establish a definite indication for the diagnosis of lightning stroke.

J. D. Cluts, D. V. S.

Canton, Ill.

INFECTED PENIS IN BULL

The accompanying illustration is of a pure-bred Hereford bull that was treated by Dr.

G. A. Rostetter of Kansas. This bull was first observed about the 10th of May and had been

affected for about one week. As noted in the illustration, the sheath was greatly enlarged and was dense and hard. The portion protruding had the appearance of granulation tissue and involved the penis. About six inches of the penis and granulation became necrotic and sloughed in the early part of June. The swelling was gradually subsiding when the case was observed about July 1st, but the bull is emaciating quite rapidly.

A positive diagnosis has not been made. It is possible that the condition may be actinomycosis. It was evidently due to some infection.

The bull will not be of any value for breeding.

A. T. K.

HEIFERS FAILING TO BREED

I have three heifers under my care that do not breed. These heifers were raised under my supervision according to my ideas of raising heifers and along the same lines as hundreds of others which I have raised and which have bred readily.

These heifers were started on sweet milk and fed sweet milk for about a month, then for five more were fed skim milk. In addition to this, they had a grain ration about 20 per cent protein, same as the milking herd; also alfalfa hay. However, up to six months they were somewhat restricted on roughage, as the owner considered alfalfa too expensive. The natal grass, which is about like timothy, was fed liberally most of the time. After six months, they were turned on pasture, but still received their grain ration.

They have never been stunted, never been sick except one which contracted stock yards fever from some shipped in cows. She came near going west, but by good care and treatment, she came through and now is just as large and vigorous as the other two. They have had all through since they began to eat, special steamed bone meal at every meal. This is the hobby that has "bust." In all my practice, I recommend bone meal. There are no minerals in the soil here, and I have saved hundreds of young things from rickets, got whole herds to breeding regularly and other feats too numerous to mention, by the use of bone meal and a regimen of sensible care and management, but these heifers do not breed.

Heat periods are regular. They are big, thrifty heifers, not too fat, but in A1 condition. The bull by which they were served gets the members of the herd, other than the three heifers, with calf. They have each been bred several times with no results. Can you suggest anything? I have made no examinations because it is not probable that three heifers about the same age and raised together under the same conditions should be abnormal so far as sex organs are concerned.

Can it be that the restriction of roughage before they were six months old could have any bearing? Can you suggest a treatment or line of management? Can it be that Synergins could be used advantageously?

B. T. H.

Reply by J. F. DeVine: You do not state how large a herd these heifers are in. I mean by that, supposing there are in the herd a hundred or more females and there are three apparently normal heifers in the lot that have not conceived, that would not be at all alarming or unusual, even though they were raised under the best conditions we know of today. On the other hand, if the herd is a small one, say ten head, and three apparently normal heifers are not breeding, it would be a different matter.

Personally, I do not believe that your restriction of roughage has had anything to do with it; surely not all, since you supplied them with other bulk and minerals. As to why they do not breed, I do not believe any one could answer that question with any accuracy. As a matter of fact, the cause in each case may differ. For instance, some two years ago I was called in consultation by a very good general practitioner and an unusually intelligent herdsman to examine eleven heifers in a herd of 600 females because these heifers were not breeding. The herdsman wrote me that they were sure one of the heifers was suffering with granular venereal disease and feared this might ruin the productivity of the herd. My answer was that I did not think eleven out of 600 was at all alarming and furthermore I knew nothing about so-called granular venereal disease or any harm it might do and I personally believed that no one else knew much about it, notwithstanding that much had been written on the subject. I made an appointment and later examined the animals and found quite a variety of impediments. One of the heifers that had been bred the day before I arrived, I found nine weeks' pregnant. The heifer that had so-called granular venereal disease and had not been bred or in heat according to their records for some eight months, I found five months' pregnant; normal in every way so far as I could determine; that is, the cervix was plainly sealed; the arteries pulsating good and full, and the cotyledons could be plainly handled.

Another heifer had a large fibrous band (a

relic of fetal life) over the mouth of the cervix which, of course, needed to be removed. Still another had a great accumulation of foul mucus in the vagina, held there by a remnant of the hymen and others were ovulating from the left ovary rather than the right one. Ordinarily a cow does not conceive nearly as readily from the left as the right. Others had cystic ovaries, etc., etc.

I am reciting this particular experience with the hope of pointing out that after all it is usually necessary to make a careful examination in order to get any reliable information as a guide to treatment.

SALIVARY FISTULA IN A DOG

A hound dog, 8 months old, cross between fox and bloodhound, has had a running fistula (salivary) since a pup. The location of the fistula is just below the left ear and a little anterior to it. The gland is enlarged on the external ramus of the submaxillary bone (this is as close as I can figure the cause to be). I operated on the dog about six weeks ago, dissecting out the fistulous tract but not disturbing the gland, as the owner requested me not to. The dog was given an H. M. C. tablet, followed one-half hour later by ether, ⅜ths lb., but didn't go completely under. Therefore, Waite's anesthetic was given and the tract dissected out. The wound did very well but secretion started soon afterwards and the tract appeared again in the course of a week. I used a strong Lugol's solution for a week, then switched to a weak solution of caustic potash without satisfactory results. Then I tried tincture ferri perchlor. The tract closed, but I had to open it as the secretion accumulated in the gland. How can I destroy the gland without further operation?—C. H. H.

Reply: Relief in cases such as you describe is quite out of the question unless one of two things is accomplished. First, an opening re-established from the salivary gland into the mouth, or where this is impracticable, as it usually is, a destruction of the gland. This you can accomplish by injecting pure tincture of iodin in small quantities, but throughout the substance of the gland; that is, make a considerable number of injections.

The effect of these injections will be very painful and the animal must have narcotics for twenty-four to forty-eight hours and possibly even a day longer if the injections are made. H. M. C. tablets will be quite satisfactory for this. Possibly for your dog, two of the No. 1 tablets in the beginning and one tablet every twelve hours afterward will be sufficient. After about forty-eight hours the pain will subside and a little later the swelling will begin to go down and recovery will probably be uneventful.

IMPACTION OF THE CROP BY CANDLES*

On November 24, 1923, a valuable fighting cock was brought to the small animal clinics of the College of Veterinary Science with the complaint that it had not eaten anything for eight days, had lost considerable weight, and had not been able to empty its crop. The fowl appeared dull and its comb and wattles were very anemic. Its temperature was normal. The crop was found distended, and on palpation, firm, hard bodies could be felt. Impaction of the crop was diagnosed. By impaction of the crop we mean that condition characterized by obstruction or occulsion of the dilated portion of the esophagus called the crop. The ingested material is retained in the crop for a long time and not passed to the proventriculus and gizzard.

The treatment prescribed in this case was powdered nux vomica in ten-grain doses to be given twice daily. For convenience in treatment and observation, the bird was confined in a cage. The following day, November 25, it passed watery feces but its crop was as firm as the day before. The crop was massaged carefully and the treatment repeated. On the third day as the treatment failed to effect evacuation. an operation was performed. Among the impacted material two pieces of paraffin about the size of the thumb attracted attention. One of these pieces was securely wedged in the opening of the crop into the proventriculus.

Paraffin and other substances of similar nature have not been reported, so far as the author knows, as causing any obstruction of the crop among fowls. Candles of tallow, wax. spermaceti and paraffin are common household articles in Filipino homes. They are used to furnish light for tables, halls and churches. Thousands of them are lighted annually in the streets during religious processions. On All Saints' Day, which occurs in November every year, most of the cemeteries in the Philippines are ablaze with candle light. This extensive use explains why pieces of candles are found promiscuously about the yards and in the streets and are picked up by the fowls running at large.

During the last two years we have received

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at the small animal clinics of the College of Veterinary Science several fine cocks, as well as hens, suffering from impaction of the crop. In a great majority of these cases these candle materials were found mixed with the impacted material.

As a result of twelve experiments in feeding paraffin, wax and tallow candles to fowls, the following conclusions were drawn: The impaction so induced is brought about by the fact that the pieces ingested soften inside the crop. When these soft pieces are compressed by the contraction of the muscular walls of the crop, they coalesce, forming a large, solid mass, the passage of which is either very difficult or impossible. Wax is not rendered soft in the crop but when of large size it clogs the lower portion of the esophagus.

Experiments conducted with the pure beef tallow proved that this substance is easily disposed of in the crop. The danger, therefore, lies in picking up substances that are rich in wax and paraffin.

The first indication of impaction is marked dullness and loss of appetite. The fowls become weak rapidly. They sit most of the time, and in advanced cases try to hide the head in the plumage by bending the neck. The most significant symptom is the persistence of a firm and fully-distended crop which is sensitive to the touch and which becomes pendulous and non-sensitive after the walls are paralyzed. Palpation may even reveal the consistency of impacted material. The temperature is not elevated but becomes subnormal as the condition becomes aggravated.

The prognosis is favorable, provided treatment is given early before the fowl has become greatly debilitated.

By far the best treatment is surgical interference consisting of making an incision in the crop at its upper portion. The impacted material should be removed and the wound sutured with a single continuous suture, after the crop has been carefully washed with a mild antiseptic. The after treatment consists in allowing the bird soft feed for about two days. Under proper conditions the wound heals rapidly and the sutures may be removed in from two to three days.

Fowls do not have a well developed sense of taste and when very hungry are likely to pick up almost anything that looks like food. Consequently where valuable fowls are kept, pieces of paraffin and wax candles should not be thrown on the ground around the houses.—Miguel Manresa, University of the Philippines.

CATTLE GORGING ON CORN

As it is getting nearly roasting ear time and these old cows have a habit of breaking out in the cornfield about that time and gorging themselves to capacity, I should like to hear from someone who has had any marked success in treating them, especially where they are found in a comatose condition with full rumen and a profuse watery discharge from the bowels. For my part, I have tried every kind of treatment with varied success. Some patients that one thinks will surely die will get well with a little treatment, while others that don't look so bad will die in spite of all that can be done for them.—H. J. T.

Reply: Probably extreme cases call for rumenotomy. Personally, we have not had to resort to this except for overloading with wheat or bran. But, it is really remarkable what can be accomplished in the way of preventing or stopping fermentation by the use of formaldehyd. Give ounce doses in capsules, once or twice daily, relieve the distress with a trocar, and it is astonishing what severe cases of overloading with green corn clear up without any other treatment than perhaps copious drenches of well diluted magnesium sulphate.

CONDITION IN COLTS SIMULATING HEMOPHILIA

I should like to have explained to me the disease affecting two to four-day old colts where they are found droopy, temperature around 104, with all visible mucous membranes very pale or icteric, and if a filly, the urine is heavy with blood. On postmortem examination, not much tissue change is noted—the tissues simply look bleached like those of an animal that has been bled to death. The blood will be found mixed with the watery fluid around the bowels. Mortality is nearly 100 per cent.—H. J. T.

Reply: We do not recall having seen this condition discussed in veterinary literature. However, it is one that receives attention in medical journals.

The condition is closely allied to hemophilia and may appear any time from the moment of birth up to ten days or a fortnight afterwards. Blood transfusion appears to be a specific for it, and even the intraperitoneal or subcutaneous injection of two to four ounces of blood seems effective.

In man, as you probably know, blood transfusion is practiced only after certain blood tests to avoid an unfavorable reaction which is dangerous in patients in the weakened condition in which this practice is usually resorted to. Since

there is not time to permit of these blood tests in the condition under consideration, it is considered a safe procedure to use the mother's blood, and if that is not available or her condition is not such as to justify the attending physician in the withdrawing of as much as four ounces of blood, a second choice is to use the father's blood. Except where injections of blood are made, the condition is nearly 100 per cent fatal.

Specifically the condition is a hemorrhage into the intestines. In cases of forceps delivery, there is usually a cutaneous hemorrhage also from the bruised areas. Epistaxis and hematuria are likewise likely to be present.

NETTLE RASH IN HORSES

I have at present two cases in horses which are both alike, and I never had a case like them before. The animals have no fever, the pulse and respiration are normal and the appetite good. But swellings come all over their bodies, from the size of a quarter up. One has these small swellings or bumps on her head and all over the body and legs. The other one has them nearly all on the trunk and legs, also under the belly. About twenty-four hours after these swellings form, they rupture and a yellowish fluid comes from them, which mats the hair and is very sticky. I was called to the first case six days ago and to the second one this morning. These horses are three miles apart on different farms. They have been getting corn, oats and hay and working every day. I put them on tincture of iron and Fowler's solution and gave a physic ball. The first case is a little better. I should like to know what this disease is called and the treatment for same—M. D. M.

Reply: If we eliminate eczema because of its chronicity and tendency to appear first on the legs, and clover disease and fagopyrism because of their predilection for areas of skin that are without pigment, and if we also eliminate food rash because of its tendency likewise to develop first on the legs, and for the further reason that the onset is ordinarily accompanied by inappetence and some fever, the symptoms you have given incline one to think of nettle rash, which is caused not only by the acrid products of nettles, ants, bees and some other insects, but may be caused as well by certain foods as green rye, potato leaves, kitchen waste, even a sudden change in food, and perhaps by other conditions not understood.

The tendency of nettle rash is to prompt spontaneous recovery. It is only in very severe cases that there is an exudate on the skin such as you describe. In all cases, cold water fomentations and friction with alcohol or vinegar are helpful; also, of course, remove the cause of the rash if it can be ascertained. In very severe cases where the condition progresses to open sores and scab formations, ordinary wound lotions such as white lotion or diluted alcohol and tannic acid are indicated. Because of the lowered resistance of the skin to infection in this condition, ointments or other applications tending to "gum up" the hair and collect dirt, are to be avoided.

OPACITY OF THE CORNEA IN A DOG

What treatment can you recommend for chronic opacity of the cornea? This case happens to be that of a small dog which connected with a cat. I treated with argyrol wash and yellow oxid of mercury ointment until it healed, but the opacity did not all disappear.—E. C. H.

Reply: Unlike opacities in the cornea of man, this condition in animals tends to clear up. How or by what process the opaque tissue is removed and transparent tissue substituted therefor is not known, but this phenomenon happens in many cases in animals. Notwithstanding the tendency to spontaneous recovery, it is advisable to treat these conditions, and particularly so in cases where the opaque area shows no tendency to diminish in size immediately following the healing of the wound that occasioned it.

The accepted treatment consists either in friction with a three or four per cent yellow oxid of mercury ointment or subconjunctival injections of a five per cent solution of potassium iodid in the upper bulbar portion of the conjunctiva. The mercury applications may be made with a swab or pledget of cotton rolled tightly on the end of an ordinary wooden applicator. The ointment should be rubbed gently but rather firmly over the scar tissue for a minute or two at least once daily.

The subconjunctival injections of potassium iodid should be made only upon the anesthetized eye. Use a fine needle and insert it under the superficial membrane of the eye near the superior margin of the cornea, directing it away from the cornea. When the injection is properly made, the needle can be plainly seen through the transparent membrane and the injection of three or four drops will cause a very noticeable elevation of the conjunctiva. Needless to say, the most careful asepsis should be observed. The potassium iodid injections need not be repeated oftener than at three or four day intervals.

REMEDY FOR "SCRATCHES" FATAL TO DOG

This formula was recommended by a dog fancier for the "scratches"—sulphur, one pound; cylinder oil, two quarts; turpentine, one teaspoonful; carbolic acid, nine drops. The owner of a dog mixed these ingredients and applied the "remedy" very liberally all over the body of his four-months-old pointer. At the time of application the dog had a raw surface the size of a silver dollar on the left ventral part of the neck. Shortly after the mixture was applied, the animal became nervous and began scratching the wound on the neck. In twelve or fifteen hours, the dog was in a paroxysm of pain, yelping occasionally and very restless; there was opisthotonos of the head, and the left foreleg seemed to be useless, with a general weakness of the entire left side of the body. The symptoms increased in severity, coma developed, and the animal died about forty hours after the mixture was applied. There does not seem to be enough carbolic acid in the mixture to have caused a poisoned condition through absorption. The turpentine may have been responsible for the intense itching of the raw surface on the neck. Is it possible that the cylinder oil or sulphur could have been responsible for the condition obtaining? Winslow states that when sulphur is brought into contact with the living tissues it is changed into sulphurous acid. What effect might this have had? Unfortunately, circumstances prevented an autopsy from being made.—J. H. B.

Reply: The carbolic acid and the turpentine in the formula mentioned would be so diluted that they would be without appreciable effect, and the sulphur, even though a rather large quantity was used, could not possibly have produced the symptoms described nor caused the death of the dog.

If the train of symptoms and death were due to the application of this "remedy," we must therefore suspect the cylinder oil. The writer is not aware of the effects of cylinder oil on the dog. However, some cylinder oils are said by the manufacturers of other cylinder oils to contain sulphuric acid, but possibly not in harmful quantity. We should be inclined to think that the symptoms and the outcome in this case were only partly due to the application of the oil and that the harmful effects of the oil were confined to an interference with the normal functioning of the skin. Dogs thoroughly anointed with any oleaginous preparation for the treatment of mange, are for a time somewhat depressed, lose their playfulness, exhibit irritability, loss of appetite and frequently a marked loss of flesh; and it is particularly noticeable that dogs treated at the beginning of an attack of distemper or other debilitating disease, rapidly succumb.

Just why this dog should have exhibited symptoms that simulate carbolic acid poisoning, we are unable to say. It seems a fair conclusion that the treatment was responsible for the death of the dog, but in just what manner or to what degree some existing but unsuspected ailment may have affected the symptoms and outcome, it is hard to state. It will be an advantage to their charges when obliging kennel men confine the use of cylinder oil to their flivvers.

CANINE DISTEMPER

I am having a great deal of trouble with distemper in dogs where it occurs in the nervous form, apparently starting with convulsions in a mild form, then becoming more violent and frequent until the case is hopeless. There seems to be a slight elevation of temperature at intervals, and the kidneys hurt on pressure. A case I had today I destroyed. Four days ago this dog had a slight chorea in the hind legs, and the owner said the animal had a little cold a week or ten days before. I started treating this dog with Fowler's solution in increasing doses, but before the treatment was well under way, convulsion after convulsion came on. I used repeated doses of barbital, which, of course, kept the animal quiet for a while, but this only prolonged the agony. Could it be in these cases that the virus or poisonous material is circulating through the kidneys and other organs with the resulting convulsions? Anti-distemper serum, in large or small doses, has no more effect on it than so much water.

One of my patients, a young Boston Bull, eight months old, never showed any signs of distemper, until I was called for treatment of a convulsion, which became more severe, and the dog died in three days. None of these cases with convulsions have discharges either from the nose or eyes, although the latter may be slightly inflamed.

I should like any suggestions as to a line of treatment for these convulsions and mainly suggestions as to their cause, as I am unable to find anything to determine and treat this condition with other than unsatisfactory results.—J. A. J.

Reply: You are not alone in experiencing great difficulty in the treatment of distemper in dogs. Nor is your experience different from

the average among veterinarians, in having a mortality approaching 100 per cent in that type of cases where the nervous symptoms predominate. The sedative you have used, barbital, is without doubt the best sedative available in such cases, but as you say, in the main it will "only prolong the agony."

The use of serum foreign to the dog in the treatment of the nervous form of distemper has attained some popularity. This treatment is purely empirical, but some practitioners have thought that the results justify its use. A normal horse serum would probably be the one of choice where this treatment was decided upon, but as it is not always easily obtainable and in most sections anti-hog-cholera serum is available, that has in the main been used. Recently Flynn has mentioned using anti-calf-scour serum. Of course, the antibodies in the anti-hog-cholera serum or the anti-calf-scour serum are not the things sought, the desideratum being the foreign proteids that the serum contains.

In the main, it must be admitted that we know little of the pathogenesis or therapeusis of canine distemper, and further than good nursing and supportive treatment, we are not able to do much for it. In an appeal for prevention, our services are more useful. There is abundant testimony that beneficial results fully justifying their use are obtained from the proper employment of biological products available for the prevention of this disease, and further that, on the average, distemper attacks are lighter and far more prone to spontaneous recovery in dogs that have plentiful exercise in the open, clean quarters and a proper diet, which for a dog, means a goodly portion of raw meat daily from the weaning period until growth is completed. For canine distemper, unlike hog cholera, blackleg, anthrax and other infectious diseases that may be mentioned, is certainly a respecter of the physical condition and stamina of the animal attacked.

Dr. D. E. Buckingham of Washington, D. C., has recently reported (in the daily press) a high percentage of recoveries in cases of canine distemper given the chlorin gas treatment. The brilliant success attained in the treatment of common colds and other affections of the respiratory mucous membranes with chlorin gas would appear to justify a trial of this treatment in canine distemper.

To return to your specific inquiries as to why distemper symptoms manifest themselves sometimes by convulsions, at other times by intestinal disorders, and at still others by pulmonary manifestations, no one has offered a satisfactory explanation of these phenomena.

THE VALUE OF CAMPHOR-IN-OIL AS A CARDIAC STIMULANT

H. M. Marvin, M. D., and G. D. Soifer, M. D., both of New Haven, Connecticut, present in the Journal of the A. M. A. a report of an exhaustive investigation of this subject. To quote in part:

"Although camphor has been employed in medicine for several centuries because of its reputed value as a circulatory stimulant, there is at present a wide diversity of opinion among clinical and laboratory workers regarding its method of action, toxicity and therapeutic value. So far as one may judge from current and recent medical literature and from conversations with practicing physicians, the drug appears to enjoy a unique favor among members of the medical profession; many of them regard it as the cardiac stimulant par excellence, the one drug to be given first in emergencies, the most reliable and speedy in its action under most circumstances, and the one to be exhibited with confidence after all other drugs have failed. It does not require a diligent search of medical literature to find numerous illustrations of these widely prevalent views; one can scarcely pick up a medical periodical without finding in several case reports the phrase: 'in spite of the administration of camphor, the patient grew worse and died.'

"An attempt to find experimental or clinical evidence in support of this widespread confidence, however, leaves one puzzled to understand whence the drug gained its reputation. There has been a large amount of experimental work on lower animals, but the results have been so contradictory as to permit no conclusions. Heathcote, in a review of the literature dealing with the action of camphor on the frog heart, points out that some observers find it to be a cardiac depressant, others conclude that it is a cardiac stimulant, while still others consider that it has no action on the normal heart but stimulates the heart that has been depressed by chloral. On the basis of the results of other workers and his own observations on the heart of the frog, rabbit and cat, Heathcote concludes that 'there is no convincing pharmacologic evidence that camphor possesses any value whatever as a cardiac or circulatory stimulant. Its value, if any, for this purpose in man should be established or disproved by more

exact clinical observations.' Sollman also feels that no conclusions can be drawn from the experimental work on animals. He states that 'the experimental effects of camphor on the circulation are inconstant, different investigators reporting divergent results and conclusions. Generally there is no definite response if the circulation is normal.' His chapter on the subject contains extensive references to the literature, which will not be repeated here.

"From the clinical standpoint, also, there appears to be considerable disagreement regarding the therapeutic value of camphor. Among those who consider it of definite importance in the treatment of heart failure might be mentioned Hosemann, Zangger, Schelcher and Shelling. The Council on Pharmacy and Chemistry of the American Medical Association declares that camphor stimulates the central nervous system, especially the medullary centers, and the circulation. It tends to increase the blood pressure. Many clinicians believe that camphor improves the pulse in impending cardiac collapse, probably by cardiac stimulation; others believe it ineffective. Osborne feels very emphatically that 'camphor is one of the best cardiac stimulants that we possess. It is a quickly acting nervous and circulatory stimulant, affecting principally the cerebrum, and causing dilation of the peripheral vessels.'

"On the other hand, Cushny is convinced that there is no reason to believe that camphor, in even the largest therapeutic doses, has any effect after absorption except to cause a slight dilation of the skin vessels, and Sollmann likewise feels that its effects, if they do occur, are inconstant and unreliable. Heard and Brooks, after a careful study of the pulse rate and blood pressure in a series of normal persons, and patients with heart disease, concluded that camphor in oil injected subcutaneously in doses as high as 50 grains failed to produce any definite effects. Eggleston states the feeling of many clinicians when he says that 'camphor has no place whatever in the drug treatment of heart failure, as even in enormous doses it is devoid of direct stimulant action on the heart or circulatory system.'"

The authors then give a detailed account of their methods of procedure and a number of charts and tables showing the effects of the administration of camphor on their various patients. The results are summarized as follows:

"In none of our patients or normal persons did camphor exert any demonstrable influence on the circulation. In general, it may be said that there were slight changes in heart rate, respiratory rate, blood pressure and vital capacity during the period of study, but these changes were inconstant in amplitude and direction, and so clearly unrelated to the time of injection that it was quite impossible to attribute them to the effect of camphor."

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"Disregarding such minor changes, a careful analysis of all our data reveals that in no single instance was the behavior of the heart rate, respiration, blood pressure or vital capacity the same after any two injections."

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"Electrocardiograms taken before, at intervals during and after the administration of camphor, showed no changes in form or amplitude of any wave."

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"We feel that camphor has no demonstrable action on the circulation in congestive heart failure, and therefore has no rational place in the treatment of that condition."

POKE ROOT IN MASTITIS

What are the results of giving powdered poke root internally, two ounces t. i. d., for mastitis? Some veterinarians claim it is very good, but my results have been varied.—A. H. W.

Reply: It is our opinion that poke root administered internally is practically without effect in the treatment of mastitis.

RABIES VACCINE A RELIABLE PROPHYLACTIC

Rabies is prevalent in certain districts of Illinois. The suppression of this disease depends largely upon preventive measures. Since dogs are the chief offenders in the spread of rabies it seems advisable to recommend the vaccination of all dogs in infected localities. The efficient control of this disease in badly infected districts is dependent upon an educational program backed by official regulatory measures which provide for the vaccination of dogs.

Keep your clients advised of the danger of this disease and how it can be effectively prevented. Rabies vaccine for animals is an efficient prophylactic. In exposed animals more than one treatment is necessary. The systematic vaccination of dogs would probably reduce rabies to a minimum. Veterinarians have an important responsibility in recognizing suspected cases, and in advising the Pasteur treat-

ment for the protection of persons exposed through the bites of animals. So far as is known rabies is not communicated from animal to animal, or animal to man except by the bites of rabid animals.—Animal Pathology Exchange, University of Illinois.

The Army Station Meat and Dairy Hygiene Service

By Capt. Geo. H. Koon

The veterinarian of a camp, post, depot, purchasing point, or other station or separate command is charged with making the veterinary inspections pertaining to meat and dairy hygiene as described in Army Regulations; with making suitable recommendations as to the acceptance or rejection of meats and meat food and dairy products, the disposal of rejected supplies and the suitability of the various sources of supply; and with preparing the prescribed records and reports. The technical procedures of these inspections and the routine records and reports required are enumerated in Army Regulations.

The meat and dairy hygiene service of a station or command includes the inspection of meats and meat food and dairy products received and issued by the quartermaster or purchased from local butchers and dealers; of the sources from which these supplies are obtained; and of the dairy herds and farms from which the milk supply is obtained. In general terms, these inspections, as regards supplies, consist of the examination of elementary food products of animal origin at the place of production, purchase, receipt, or issue to troops. It is contemplated that they shall apply, so far as practicable, to all meats and meat food and dairy products received by a command or any part of it.

In the larger commands, the service is most efficiently provided for by the issue of a station order outlining the requirements and designating a building or place as the only point of entrance of such supplies to the command. They are here examined by the station veterinarian at a specified time and passed or rejected. All supplies inspected are appropriately marked or stamped by the inspecting officer irrespective of prior inspection and stamping. When such supplies can not be stamped because of their character or small size, the stamp is placed on the container or package.

The inspection of company kitchens, messes, or refrigerators for the purpose of examining food products which have already passed the designated veterinary inspection at time of receipt at the station or at issue, the supervision of the fresh milk supply after the milk leaves the charge of the dairyman, and the inspection of ice cream factories, restaurants, and eating places, are duties which pertain more specifically to the general sanitary service than to the definitely technical functions of the veterinary service.

The inspection and reinspection of the meats and meat food and dairy products received and issued at the local commissary covers soundness, and is made at the time of delivery to the quartermaster, at or shortly before issue and as frequently in the interval between receipt and issue as their condition may require. In connection with these inspections and reinspections, the sanitary condition of refrigerators and other storage rooms is observed and reported. The adaptability and cleanliness of vehicles used for transporting such supplies and the methods of handling up to the point of delivery to organizations receive like attention.

Simultaneously, there is maintained such inspection for compliance with government specifications as may be required by the quartermaster. The station veterinarian ascertains these requirements and, with the approval of the commanding officer, sees that adequate veterinary personnel for meat inspection duty is available at such times and places as will meet the needs of the quartermaster. With the approval of the commanding officer, he renders such reports as the quartermaster may desire or may be directed by his superiors to submit.

The proprietors or operators of establishments who propose to supply meats and meat food and dairy products to any station or command should apply in writing to the commanding officer thereof for inspection regarding the sanitary condition of their establishments, their animals, and the source from which the supplies to be delivered are derived. This initial inspection is conducted by the station veterinarian. It includes a survey of the plant and premises to ascertain whether the same are in a sanitary

condition, and whether facilities necessary to a proper conduct of subsequent routine inspections can be provided. The veterinary officer indicates to the proprietor or operator what changes or additions should be made for the correction of unsanitary conditions, if such exist in or about the establishment, and specifies the kind of inspection facilities to be furnished. When the establishment has been placed in an acceptable condition, the veterinary officer recommends to the commanding officer, through the surgeon, that the application be approved. Such establishment, so long as it continues a source of supply for the command, should thereafter be inspected at least once every month.

The station veterinarian makes so far as practicable an ante-mortem examination of animals from which any meat or meat product is to be offered for the use of the command. If upon such an examination an animal is found to be affected with any disease or condition that may render its meat in whole or in part unfit for human food, such animal is excluded from the lot of animals to be slaughtered for the use of troops. All animals which are sound and fit for food so far as can be determined by the ante-mortem examination are passed for further inspection at the time of slaughter.

Animals bought on the hoof are inspected by a veterinary officer whenever one is available, preferably prior to acceptance, and always prior to slaughter and subsequent thereto. When practicable, live animals should be accepted for purchase subject to ante- and post-mortem findings. A veterinary officer when present may be called on to act in an advisory capacity in the interpretation of government specifications for animals purchased in the field.

The post-mortem inspection is made as soon as practicable after slaughter and is thorough and complete. When disease or abnormal condition is found at such inspection the veterinary officer determines the fitness or unfitness of the meat in accordance with the prescribed standards. Any carcass judged to be other than sound and fit for human food is condemned for the use of troops.

Products inspections following the prescribed procedures are carefully made and an examination of the finished products is required on delivery at the station. When such products are to be acquired by a supply officer, inspection for compliance with specifications should be included.

The inspection and supervisory work of the Department of Agriculture, U. S. Public Health Service, or other recognized competent agencies in local establishments and dairy farms are not duplicated when reports of these inspections containing the necessary information are available and where the standard maintained is satisfactory to the station veterinarian and the surgeon, and approved by the commanding officer; with these exceptions, inspection requirements are applied to establishments selling officially inspected food supplies, and all such supplies are in any event subjected to veterinary inspection on delivery at the station.

When an establishment is not properly operated or does not maintain a satisfactory standard of sanitation, and correction of these defects can not be obtained after the matter has been properly brought to the attention of the proprietor or operator, written recommendation is made by the station veterinarian, through the surgeon, to the commanding officer that its products be excluded from the command.

When meats and meat food and dairy products received by, or offered for sale to, a quartermaster are found on delivery to present any sanitary defect they are rejected. In the unusual event that it is necessary to meet the immediate needs of a station, such supplies received by, or offered for sale to, a quartermaster, found on delivery to be affected with an unsoundness of slight or limited extent, which in the opinion of the veterinary officer can be removed by trimming, wiping, or other manipulation, the treatment which the latter considers advisable is recommended to the quartermaster and, after such treatment has been applied, a reinspection is made, and if the defects have been removed acceptance is permissible provided that the use of the supplies for food does not constitute a menace to the health.

In the case of meats and meat food and dairy products in the possession of a quartermaster found to be affected with an unsoundness of slight or limited extent which in the opinion of the veterinary officer can be removed by trimming, wiping, or other manipulation, the treatment which the latter considers advisable is recommended to the quartermaster and, after such treatment has been applied, a reinspection is made.

Meats and meat food and dairy products in the possession of a quartermaster which are found by the veterinary officer to be unsound or otherwise unfit for food purposes and consequently unsuitable for issue, either in part or in whole, are reported to the quartermaster for survey.

(To be continued)